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International Raises Newsprint Price $2.50

Increases Contract Quotation $2.50 Per Ton for First Six Months of 1935—Limits Itself to Further Increase of $2.50 Per Ton for Second Half of Year, i.e. $5.00 Per Ton Over Present Net Cost—Company Endeavoring to Act Conservatively Under Difficult Conditions—Lead for Other Newsprint Manufacturers Seen

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 12, 1934—The International Paper Company, in a letter forwarded to its customers at the week-end announces an increase in its contract price for newsprint of $2.50 per ton for the first six months of 1935 and limits itself to a further increase of $2.50 per ton for the second half of 1935, except to the extent necessary to offset further possible inflation in the United States dollar, as measured in terms of gold.

Text of Announcement

The following letter, signed by J. L. Fearing, vice president, was addressed to customers of the company:

"Referring to our contract with you, we hereby fix the price for newsprint for the year 1935 at (price varies according to zone). We will allow during the first six months of 1935 a temporary discount of $10.50 a ton. This will make your net cost from January 1 to June 30, inclusive, $2.50 a ton more than it is today.

"In 1930 the net cost of North American newsprint to the publisher was more than 50 per cent above the present level. The present level has, as you know, remained unchanged for over a year and a half in the face of constantly increasing wage levels and price levels for materials and supplies. During the same period the prices of all other grades of paper have advanced materially. Newsprint alone has failed to advance.

"Little or no return is being earned on the hundreds of millions of dollars of capital invested in the newsprint industry. In many cases a new dollar is not being earned for an old one and many modern properties have survived only at the expense of their working capital. The industry now faces further increases in costs.

Pledge for Second Half of 1935

"For deliveries during the second half of 1935, we will, however, not change the temporary discount above specified so as to increase the net cost of our paper to you by more than an additional $2.50 a ton (that is by more than $5.00 a ton over the present net cost of our paper to you) except to the extent necessary to offset further inflation as measured by any decline in the gold value in a free market of our dollar between Nov. 10, 1934, and the date of our notification to you of the change.

"We hope you will realize that we are endeavoring to act conservatively under the difficult conditions with which we are confronted."

Representatives of the Canadian newsprint industry, when informed of the International Paper Company's action, which was taken independently, expressed the view that it was an eminently moderate and constructive course.

The increase in price will be effective in respect to the output of Canadian International Paper Company, subsidiary of International Paper Company and one of the most important units in the Dominion's newsprint industry. In past years, International Paper Company usually has been the first to announce at about this time of year its price for the ensuing year's contracts and the announcement by International generally has been the forerunner of similar action by individual companies in the newsprint business in Canada.

Premier Taschereau Takes Action

From Quebec it is announced that the Quebec Government has cancelled two Orders-in-Council whereby the St. Lawrence Paper Company were allowed (1) a reduction in stumpage dues from $2.70 per 1000 feet board measure to $2.35, and (2) whereby the company was allowed to cut timber below the 10-inch diameter limit. The cancellation of these two privileges will seriously affect the cost of providing newsprint.

Premier Taschereau, commenting with satisfaction on the action of the International Paper Company in raising the price of newsprint, said the original suggestion was to raise the price to $45 per ton, but the decision to raise the price by $5 in two instalments was a "reasonable compromise." He added: "An increase of $2.50 per ton means an addition of $5,000,000 for the Canadian manufacturer which, I hope, will take care of, to a certain extent, increased wages and will also give a certain return to bond and shareholders."

Canada Ready to Act In Newsprint Crisis

Federal Cabinet of Dominion Receives Delegation Representing More Important Interests—A. R. Graustein, President of International Paper & Power Co., Expresses Hope That Problem Will Be Solved Through Tolerant Consideration

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 12, 1934—The Dominion Government has announced that it is ready to take action in respect to newsprint prices at any time when requested by the Provincial Governments of Quebec and Ontario to act. This is the latest development in the newsprint situation, and it is one that has given great satisfaction to leading operators in the industry.

This decision was announced on Thursday last, after a conference with a delegation representing the more important interests in the industry. This delegation consisted of A. R. Graustein, head of the International Paper and Power Company; Charles Vining, of the Newsprint Export Manufacturers' Association; G. T. Clarkson, receiver for the Abitibi Pulp and Paper Company, and L. J. Belnap, president of the Consolidated Paper Corporation.

While making it clear that they did not presume to speak for the whole industry, the members of the delegation expressed a determination to extricate the industry from its present unfavorable position.

A. R. Graustein Addresses Federal Cabinet

Mr. Graustein, in addressing members of the Federal Cabinet, said, according to a summary of his remarks later given to the press:

"I am not here to request or suggest that the Government take any action in respect of the newsprint situation. I am still hopeful that the serious crisis in which the industry finds itself today will be solved through tolerant consideration of manufacturers and publishers for the interests and problems of one another.

"The industry has greatly appreciated the helpful and active interest in its problems taken by the Prime Ministers of Quebec and Ontario. These provinces as proprietors of the larger part of the timber resources on which the Canadian industry is based have throughout the depression come to the assistance of the industry by voluntarily reducing their charges as landlords.

"I am here with no authority to speak for the industry but merely to seek an expression of attitude of the Dominion Government in regard to the exercise of its influence in the interest of a solution of the industry's problems on a basis of fairness to the provinces, to the workmen, the farmers, and, above all, to the consumer whose prosperity constitutes the foundation upon which Canada's greatest manufacturing industry must rest and whose goodwill must be rated as its first asset.

"The necessity of any formal action in the direction of the control of the industry by the Federal Government by the fixing of prices or otherwise would be a disaster which we hate to contemplate. To avoid it the great majority of the industry have exerted and will exert themselves to the utmost."

Export News Print Board

There has been a good deal in the newspapers here about the possibility of the establishment of an Export News Print Board, but it was learned that this proposal was not discussed at the meeting. While no statement was made on this point it is believed there was some concern lest a large number of existing contracts might be seriously disturbed and lest the establishment of such a federal price-fixing body might have an injurious effect upon the markets in which Canadian newsprint is controlled.

An export newsprint board might, however, be operated effectively in connection with exports to the United States without being affected by the fact that considerable shipments are being made to the United Kingdom at prices understood to be under the $45 mark.

Move Rests With Provincial Governments

The real move is now clearly up to the Provincial Governments of Ontario and Quebec, and the belief is that action will follow, failing an amicable settlement within the ranks of the industry. Meanwhile both governments are using their good offices to bring this about.

It is announced that prior to the visit of the delegation to Ottawa, both Premier Taschereau of Quebec and Premier Hepburn of Ontario had communicated to Prime Minister R. B. Bennett their desire that he attempt settlement of the price fixing difficulties, and it was at the request of Premier Taschereau that Premier Bennett agreed to receive the delegation. Mr. Taschereau, in a further statement on the subject, said: "As to exactly under what law action would be taken will naturally depend upon the interested parties, and particularly upon the decision of the federal Government. I met the representatives of several newsprint companies in Montreal yesterday and we discussed the whole situation together."

While Quebec and Ontario appear to share the same opinion that prices should be higher there may be other provinces where newsprint prices are extremely low, the Premier pointed out. British Columbia, for instance, was reported to be selling at disastrously low prices which, it is alleged, are at times cut as much as seven dollars lower than the prevailing rate here.

B. C. Paper Box Companies Merge

From Vancouver it is reported that while final details are not yet concluded, arrangements are underway for the taking over of National Paper Box, Ltd., by Sidney Roofing and Paper Company, Ltd. The two companies have had a business connection of many years standing, as the National Paper Box has purchased the major portion of its paper board requirements from the Sidney Roofing and Paper Company.

National Paper Box has been in business in Vancouver since 1913 with main plant at Vancouver and a plant at Victoria operated by a subsidiary: Victoria Paper Box Company, Ltd.

Sidney Roofing and Paper Company has its main plant at Victoria with a branch plant on Granville Island, at Vancouver.

M. H. Morley To Go With Thames Board Mills

M. Howard Morley, who has been associated with the International Paper Company for some 18 years, and for the last 6 years manager of the Book and Bond Division, has tendered his resignation, effective January 1, 1935.

Mr. Morley is joining the Thames Board Mills of Purfleet, Essex, England, who are planning to build a new mill in the very near future, in the north of England.

Activities of Wisconsin Paper Manufacturers

Demand for Insulation and Filler Products of Pal-O-Pak Company, Hartland, Wis., Expanding —Operations of Converting Department of Riverside Paper Corp., Appleton, Increase —Menasha Products Co.'s New Addition Completed

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 12, 1934—Since perfecting a satisfactory chemical fireproofing formula a few weeks ago the Pal-O-Pak Company, of Hartland, Wis., is finding a greater demand for its insulation and filler products, according to Leslie Palmer, vice president. The new material is now in production, after six months of experimentation, and will bring the company into the construction market. Approval has been obtained from the bureau of standards, and architects are now specifying Pal-O-Pak insulation for buildings.

This company was started four years ago by Mr. Palmer, a civil engineer who had invented a machine to chew up waste paper by air force instead of knives. It was found to be an ideal insulation material. Manufacture was started on a small scale and the company recently made its third move as business expanded, now occupying a plant with nineteen employees. A corporation has been formed with local capital, and F. W. Irish has been elected president of the company.

Most of the orders come from building contractors and refrigeration concerns. The fluffy nature of Pal-O-Pak has made it popular also because of its cheapness for seat cushion fillers. An order was recently filled for 15,000 seat cushions for Chicago Cubs baseball park grandstand, and 20,000 for Soldiers' Field, Chicago.

Demonstrations since the fireproofing treatment was applied have proven under the most severe tests that Pal-O-Pak can meet all requirements of building codes, and the company bases plans for rapid expansion on this improvement. A further advantage is found in using this substance to pack walls as a means of improving acoustics.

Riverside Paper Mill Active

Operations of the Riverside Paper Corporation, Appleton, Wis., have shown an increase over 1933. This gain has been partially due to the progress made by a new converting department added in 1930. Fifty employees have been added in this division, devoted mainly to ruling, drilling, round cornering and cutting of papers for school use. An important part of the mill output is now consumed in these specialties, which have met a ready demand among the company's extensive list of jobbers. At peak production period, the mill is employing 160 persons, with an annual payroll of $175,000. Graded sulphites for the jobbing and converting market form the chief output of the mill.

Sulphite and Sulphate Waste Disposal

A commercially practicable process for disposing of sulphite and sulphate mill waste has been devised and will be tried in actual operation at a paper mill, according to L. F. Warrick, state sanitary engineer, in a discussion at Green Bay, Wis., last week relative to removal of pollution in the Fox river. He is urging cities to install sewage disposal plants, in view of the intention of the state board of health to persist until the pollution is removed.

"Treatment of paper mill wastes is entirely a separate problem from that of sewage disposal, and a definite program on this objective is under way," declares Mr. Warrick.

"Under a voluntary agreement, all paper mills of the state have agreed not to dump more than one per cent of fibrous waste into any stream, and have installed equipment to assure this result," he further said. "The problem now is the elimination of the chemical wastes incident to the operation of sulphite and sulphate pulp mills. Heretofore, the cost of disposing of these wastes has been so high that it would have bankrupted the industry, but experiments have led to the belief that a commercially practicable process has been devised. This is soon to be tried in actual operation at a paper mill, and if it proves successful, all mills will be required to install it.

"While the paper mill wastes are injurious to fish life, they are not deleterious to health," Mr. Warrick pointed out. "They are not part of the sewage disposal problem. These wastes could not be run through the treatment plant because they would interfere with bacterial action upon which the treatment depends."

News of the Industry

Work has been completed on the $18,000 addition to the plant of the Menasha Products Company, Menasha, Wis., the carton subsidiary of the Marathon Paper Mills Company. The addition included basement and one story of brick, and is to be used for storage. C. R. Meyer & Sons Company, Oshkosh, Wis., had the contract and completed the work in about a month.

With preparations being made to close navigation on the Fox river, movement of coal to paper mills is about at an end for the season. October shipping was heavy to build up stocks, with 3,745 lockages reported by the federal navigation officials. Total tonnage moving through for the month was large.

Dredging operations in the Fox river at Rapid Croche, near Kaukauna, Wis., are completed. This work has been in progress for several weeks, to improve the facilities at a new lock recently installed there.

Groundwood control problems were discussed by the Society of Chemical Engineers of the Kimberly-Clark Corporation at a meeting last week at Conway hotel, Appleton, Wis. Rex Wells presented the topic, assisted by J. A. Limpert. Membership of the society is restricted to thirty men, and meetings are held monthly.

The decision in the Sensenbrenner stock case, scheduled for November 6, has been deferred to December 1 by Judge Fred Beglinger in circuit court at Oshkosh, Wis. He was to rule on motions after suit. The case is one in which a verdict of $22,600 was awarded Mrs. Lois Thom Nichols against F. J. Sensenbrenner, president of the Kimberly-Clark Corporation, as a determination of the value at the time the defendant purchased the shares. Motions were made to have the answers of the jury changed, or failing in that, to seek a reversal of judgment on facts.

George J. Schneider, second vice president of the International Brotherhood of Papermakers, was elected a congressman from the eighth district of Wisconsin at the fall elections. He resides at Appleton, Wis., and re-enters Congress for a sixth term. He was defeated two years ago after serving five terms. Mr. Schneider last week attended a meeting of the executive committee of the union at Albany, N. Y.

Demand for Paper Fairly Active In Boston

Sales Volume of Both Fine and Coarse Papers Generally Sustained—Quotations Well Stabilized In Envelope Industry—Steadiness Prevails In Box Board Market—Foreign Manila Rope Arousing More Interest—New Twine Business Developing

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 12, 1934—A fair amount of business was transacted by both fine and wrapping paper merchants in the Boston market during last week. It is stated in some quarters that business is keeping up well. Activity in fine paper in one case, at least, continued about as last month, which was better than the previous one. A strong effort is being made to stop chiselling. Prices are well stabilized in the envelope branch of the industry. The Envelope Code, which was adopted in the spring, is being observed practically 100 per cent, it is reported.

It was a fairly good week in box boards, although there has been no great seasonal increase in the volume of sales. Prices have remained steady.

With the exception of a few transactions in foreign manila rope, totalling a substantial amount, which approximated 100 tons, the paper stock market remained dull, in all divisions, old papers, bagging, new and domestic rags and foreign rags. The movement in foreign manila rope pushed the quotation up to 1.75 @ 1.90, compared with a previous flat 1.75.

The twine business is reported as excellent, with considerable new business developing.

New England Paper Merchants Elect

At the annual meeting of the New England Paper Merchants Association, held Thursday evening at the Hotel Vendome, the following officers for the ensuing year were elected.

President, William N. Stetson, Jr., of Storrs & Bement Company; First vice-president, in charge of the Wrapping Paper Division, Robert N. Stone, of Stone & Forsyth Company; Second vice-president, in charge of the Fine Paper Division, Frank H. Winter, of Carter, Rice & Co., Corp.; secretary, Frank B. Cummings; auditor, Frank Halloran, of the Century Paper Company, Inc. Executive Committee—W. B. Porter, Jr., of Cook-Vivian Company, Arthur Biza, of Henry Lindenmeyer Sons, Hartford, Conn., both of the Fine Paper Division; John E. Roach, of the Fort Hill Paper Company, and John R. Halkyard, of the Providence Paper Company, Providence, R. I., both of the Wrapping Paper Division; John H. Brewer, of Storrs & Bement Company, of the Fine Paper Division, and Floyd H. Blackman, of D. F. Munroe Company, of the Wrapping Paper Division, were appointed as representatives to the National Paper Trade Association of the United States. President Stetson appointed a Credit Committee.

Matthew O. Byrne, a delegate of the Wrapping Paper Division to the National Paper Trade Association, reported in regard to the meeting of that organization in Chicago. Charles A. Esty, also a delegate of the Fine Paper Division, and Code Authority of Region No. 1, spoke in relation to the Code. C. A. Spaulding, assistant secretary of the National Paper Trade Association, discussed association matters. About sixty were present.

News of the Trade

The Storrs & Bement Company has issued its new condensed price list of various lines handled by this concern. The pages, which number 68, are in a new loose-leaf binder, durable and convenient, invented by Charles F. Small, manager of the sales service department. Mr. Small has applied for a patent on his invention .

A sales meeting of Storrs & Bement Company was held November 3, at which Norman Harrower of Linton Bros., Fitchburg, Mass., talked on the uses of Bristols and the advertising plans of his company for 1935. President William N. Stetson, Jr., presided.

A general meeting of Carter Rice & Co., Corp., was held recently, at which George Wright, of the twine department of that concern, discussed twines, bringing out interesting points in regard to the uses of that commodity. Streeter Bush, assistant sales manager of the wrapping paper department of that company, presided.

J. F. Blackman, vice-president of the D. F. Munroe Company, and in charge of the twine department of that company, has gone on his annual hunting trip to Northern Maine.

Joseph E. Holmes, treasurer of the Crocker-McElwain Company, Holyoke, Mass., who has a good many friends in the trade, and Roger Taft, of New York, sales manager of the Hammermill Paper Company, Erie, Pa., were in town last week. Adam C. Remley, vice-president and general manager of the Patten Paper Company, Appleton, Wis., John A. Remley, of the same company, and Calvin C. Yates, president of Eaton, Dikeman, Mount Holly Springs, Pa., recently called on the trade.

Discuss Higher Freight Rates on Paper

[FROM OUR REGULAR CORRESPONDENT]

POTSDAM, N. Y., November 13, 1934.—A conference of business men was held here last week relative to proposed increases in freight rates at which the subject was discussed by H. J. French, division superintendent of the New York Central Railroad. He declared that under the new schedules the tariff on paper products would be increased ten per cent with a maximum of three cents per hundred pounds and that pulpwood would be raised one cent per hundred pounds if the Interstate Commerce Commission approves the application at hearings next month. He said that increased cost of wages and materials have placed an additional burden on the railroad and the rate of traffic caused the decision to advance rates. A number of the concerns in this section use motor trucks in shipping their products while others use the railroad. It was explained that only certain commodities would be affected.

Royal Card Opens Chicago Office

The Royal Card and Paper Company of New York has opened an office at 536 South Clark street, Chicago, in the Rand-McNally Building, Room 923. The Royal lines are well known in the fine paper field, especially among the greeting card manufacturers. This office will be in charge of Chas. L. Streeter who is well known to the trade. Sample books and a complete line of full size sheets for samples will be carried.

Philadelphia Paper Market Conditions Improve

Demand for Various Standard Grades of Paper Broadens—Bond and Ledger Papers Are In Good Request—Book Papers Share General Betterment—Paper Stock Dealers Petition Washington for Retention of Established Minimum Prices

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., November 12, 1934—While waiting for a chance to study and analyze the portent of the recent election results, the paper industry here feels that business sentiment—which is a big factor in the present situation—will level off for the next week or two. There is nothing to indicate any prospective slump in business sentiment; those with whom your correspondent talked stated that it just seems reasonable to expect a bit of waiting period—a sort of stock taking.

It is quite evident that the New Deal has been pretty heartily endorsed. In all probability this means a continuance of the Administration's purpose to prod business into activity by Governmental spending and activity. This enlarged spending, it is thought, will promote consumption and the forecast is that business will respond rather readily.

The paper market as a whole experienced a decided impetus this week. Orders continue in increasing volume. Bonds and ledgers were in good demand, and book papers came in for their share.

Franklin Memorial Paper Exhibit Planned

The Advisory Committee, consisting of Norman A. Considine, chairman, W. S. Wilcox, James A. O'Neill, Sr., and W. B. Kilhour, Jr., recently appointed by T. H. B. Smythe, president of the Paper Trade Association of Philadelphia, met during the week with Director Davis, who is in charge of Graphic Arts and Paper Division of the Franklin Memorial, and tentatively outlined plans for the paper exhibit which is to be a permanent feature at the Franklin Memorial.

Mr. Considine reports that a number of manufacturers have evinced considerable interest this past week in this project and are cooperating to the fullest extent, and within the next ten days the preliminary part of this exhibit will be set up and working on schedule. Manufacturers of paper products, etc., are desirous of installing machinery to be put in actual operation. Several pulp producers have already taken steps to confer with the authorities as to the best way of demonstrating the working of machinery for paper making from fiber wood. Engravers, too, are to have demonstrations of the suitability of various types of paper for printing process, and also for reproducing fine details.

Bag and envelope manufacturers likewise are working out plans for the exhibition of their respective products. Responses have been received from all over the country but preference, of course, is to be given to local tradesmen wherever possible.

Paper and Cordage Association Activities

Practically the last meeting of the year for the Philadelphia Paper and Cordage Association, Inc., will be held in the Rose Room of the Adelphia Hotel on Friday of this week. President George K. Hooper and Secretary Harry S. Platt are very desirous of having a full attendance at this meeting, which will consist of a round table discussion of past and future events, and plans will be crystalized for the elaborate Christmas party to be held on Wednesday, December 19, at which Mayor Moore of Philadelphia will be the guest speaker.

Waste Paper Emergency Price Endorsed

At a mass meeting of the Philadelphia Waste Paper Dealers, held at Panonia Hall, it was voted to officially petition Washington for the extension of the minimum waste paper price. The meeting, which was called for the special purpose of securing the opinion of the dealers in regard to the present emergency for waste paper, was one of the largest ever held in Philadelphia. The dealers present not only voted unanimously in favor of an extension of the emergency price, but in a wire to the trade counsel requested the Emergency Order to be extended not for a period of ninety days, but indefinitely.

Petitions were signed by all present. These petitions were forwarded to Washington to the National Recovery Administration.

Weekly Production Ratio Report

Reports to the Paper Industry Authority show the following Over-All Industry Production Ratios for designated weeks:

	Reporting Mills		Total Production
	Number	Capacity	Ratio
*Week ending September 1, 1934	269	107,121	75.7%
*Week ending September 8, 1934	291	107,676	52.5
*Week ending September 15, 1934	287	112,372	58.3
*Week ending September 22, 1934	291	119,926	60.8
*Week ending September 29, 1934	296	125,937	64.3
*Week ending October 6, 1934	296	120,501	65.0
*Week ending October 13, 1934	293	120,964	64.0
*Week ending October 20, 1934	360	150,250	66.1
*Week ending October 27, 1934	346	150,460	62.5
*Week ending November 3, 1934	277	115,310	61.8

The weekly paper capacity (based on 6 days of 24 hours each) for all mills operating wholly or partially under the General Code for the Paper and Pulp Industry is approximately 175,000 tons. This figure has been tabulated from mill questionnaires and in certain instances from daily capacities given in Lockwood's Directory of the Paper and Allied Trades.

Detailed statistics showing the number of mills reporting by ratio groups are given below:

NUMBER OF MILLS REPORTING *

	Week ending									
	Sept. 1	Sept. 8	Sept. 15	Sept. 22	Sept. 29	Oct. 6	Oct. 13	Oct. 20	Oct. 27	Nov. 3
Ratio Limits	1934	1934	1934	1934	1934	1934	1934	1934	1924	1934
0% to 50%.....	117	147	128	112	103	111	110	140	132	114
51% to 100%.....	152	144	159	179	193	185	183	220	214	163

* Subject to revision.

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours," were as follows:

Week ending September 8	53 per cent
Week ending September 15	67 per cent
Week ending September 22	62 per cent
Week ending September 29	64 per cent
Week ending October 6	64 per cent
Week ending October 13	64 per cent
Week ending October 20	64 per cent
Week ending October 27	63 per cent
Week ending November 3	61 per cent

Revised statistics covering delinquent mill returns will be shown in later reports.

Chicago Paper Market Conditions Irregular

Some Improvement Reported in the Kraft Paper Section—Fine Paper Division Displays Healthy Undertone—Book and Cover Papers Firmer—Bond and Ledger Papers Spotty—Demand for Various Grades of Paper Board Improving

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., November 12, 1934—Chicago reports as to business conditions vary sufficiently this week to fit the characterization of "spotty." In the main, however, the various markets showed a tendency toward continued firmness, the kraft market, in particular, being reported as improved. The newsprint situation is somewhat better, although representatives here are convinced that there is much to be done in the way of upward revision of prices before any real improvement may be registered. Fine papers showed a healthy tone, some mill representatives here reporting outstanding sales improvement over the same period a year ago. Bonds and ledgers were reported as noteworthy examples of a condition wherein some mills stated their pleasure over increased sales, while others noted a not so optimistic comparison. Books and covers remained about as last week, more firming in the book market taken as a sign of improvement. The paper board industry showed some increase in business during the week. The waste paper market, mildly up in activity from the previous seven days, was awaiting with interest the court case resulting in the injunction suit brought by one local waste paper house charging many local houses with unfair practices in relation to control of prices and the market. The suit will come up on December 5.

Paper Salesmen Discuss Contracts

A discussion of contracts and contractual relations, featuring the Monday, November 5, meeting of the Salesmen's Association of the Paper Industry, Mid West Division, resulted in the drafting of a resolution to be mailed to the Eastern Division in the hope that it may be approved and forwarded to the Paper Industry Authority for immediate action. The resolution prepared by the Mid West Division set forth a number of reasons why there was immediate need for simplification and complete unification in the matter of contracts covering all divisions. The preamble pointed out that the industry is approaching the time when new contracts will be entered into and renewals necessitated and warned that during 1934 there had been considerable variation between various divisions in contract provisions which had caused misunderstandings and which would continue to do so unless unification was brought about. It was further noted that many salesmen do not know what the conditions of a contract are in all divisions in which they are selling and that these conditions have been takn advantage of by many buyers, thus actually penalizing the sellers who do understand the provisions and who enforce the proper contractual relations.

Having set forth these reasons why action should be taken, the Mid West Division suggests that immediate steps be taken by the Coordinator and the Authority to unify contract requirements in so far as possible in all divisions and that this action be taken immediately and effective December 1, at which time many contracts will be up for discussion for the forthcoming year. The Association suggests that the provisions for contracts be very clearly stipulated for all divisions and in this form forwarded complete not only to all mills but to the Salesmen's Association of the Paper Industry—both Eastern and Mid West Divisions—for distribution to their membership. To insure complete distribution and to further unification the association suggests that all mills be advised of this action by the Authority and be provided with the full release so that those not having membership in or contact with the Salesmen's Association, as a distributive agency, may properly inform their salesmen. The resolution, now in the hands of the Eastern Division for study, comment and approval, further states that the Salesmen's Association of the Paper Industry will promise to do all in its power to help bring about unification by discussions and full explanations of the various details involved in an effort to bring about complete understanding of the details of contracts in each and every division.

News of the Trade

Alvin E. Dodd, executive vice president of the American Management Association, sponsors of the annual packaging expositions, has announced that the fifth annual packaging exposition will be held in Chicago March 5 to 8 of next year. Concurrent with the Exposition, which will be held at the Palmer House, will be the association's consumer marketing conference and conferences and clinics on packaging, packing and shipping. An attendance of more than 7500 package users, business executives, merchandising experts and production men is expected. The paper industry, in all divisions represented in the study and supply of paper for packaging purposes, is expected to take an important part in the exhibits and in the program itself.

The Rag Content Division of the Writing Paper Manufacturers Association met at the Blackstone Hotel, Chicago, on November 7, to discuss a wide range of matters of importance to this division of the industry. Emmett Naylor, secretary, called the meeting and supervised the program.

Members of the Mid West Division of the Salesmen's Association of the Paper Industry received an unexpected treat at the November 5 meeting, when George K. Gibson of Mosinee distributed the second edition of "A to Z," a complete roster and historical study of the Mid West Division of the association. The forepart of the pocket size book contains a replica of the program at the 1920 banquet of the Association at the LaSalle Hotel, even to the menu. Past presidents, committees, and other data, round out the book which is proving popular not only with the early members but with all who want to keep in close touch with the activities of this progressive association and its program.

E. H. Larkin, divisional sales manager of the Bryant Paper Company, has recently been elected a vice president of that company. Mr. Larkin will continue to represent the Kalamazoo company in the Chicago sales offices in the *Daily News* Building.

Number Five in the series of "Redemption Bond's Letterhead Parade" reached the desks of Chicago paper buyers this week, mailed out by the Swigart Paper Company, local distributors. Included within the "Parade" is a replica of the letterhead of Soprani, Inc., with an excellent testimonial to the value of luxury in stationery; together with another letterhead and testimonial as to the value of the letterhead as good advertising and issued by the Far West Lithograph and Printing Company.

Mead Asserts Prosperity Is Due to Return

DAYTON, Ohio, November 12, 1934—George H. Mead, president of the Mead Paper Corporation, addressed the Foremen's club in the N. C. R. schoolhouse Monday night at one of the largest meetings in the history of the organization.

Mr. Mead is chairman of the industrial advisory board in Washington operating under the NRA. He dealt with his experiences there and gave very illuminating observations with respect to the conditions which brought about the national recovery act, the need of very great changes in industrial policy and the whole spirit of the administration of the codes as he sees the picture in Washington.

Mr. Mead is a very attractive speaker, ties thought and phrase together well and gives his hearers the impression of sincerity. He said that the public had little appreciation of the time which men of large affairs are giving to the effort in behalf of the business recovery. In fact, he went further and expressed the opinion that the public men in Washington, whether they be in the congress, in the cabinet or in sundry set-ups under the NRA, are not given proper credit for their devotion to the public interests. He said he had met men in all these classifications. They are serious, industrious and striving to do their utmost. It could not be expected, he asserted, that we could in 18 months repair the ills and effect a recovery following our financial and industrial debauch running over several years.

He drew noticeable applause from his audience in his tribute to Gen. Hugh Johnson, stating that he had great respect for his courage, perseverance, vision and dynamic industry.

There is nothing even in the atmosphere of Washington indicating either that we are headed toward a dictatorship or communism. Mr. Mead expressed the opinion, that the next congress, in his judgment, would refine the national recovery's act and take care of conditions which could not have been foreseen when the original law was drawn. He has no fear of individualism being destroyed in our American life. He gave the creation of the National Cash Register business as an example of what can come from the genius and efforts of one man. He said there were instances elsewhere and in the future there would be others.

Mr. Mead's talk was factual, illuminating and on the whole reflected a tranquil philosophy in his view of not only the present but the future. He confidently expects to see the country come back to a more enduring prosperity because we will have learned much from our errors.

"Bill" Lee Survives Landslide

Despite the overwhelming majorities prevailing throughout most states and localities in favor of the New Deal in the recent Fall elections, there were isolated spots where popular Republicans succeeded in stemming the tide. Niagara County in New York State is an outstanding example. There the winning Republican ticket was led by State Senator William H. Lee of the Lockport Felt Company.

The majority given Senator Lee, Republican, over Elijah H. Seaman, Democrat, of Middleport, the largest given any candidate in the county, was 11,508. The total vote in the county gave Lee 24,611 and Seaman 13,103.

Running ahead of the remainder of the Republican ticket in the county, the vote given Senator Lee was highly complimentary and a distinct acknowledgment not only of his personal popularity, but of his ability as a legislator as well.

Senator Lee carried every district in the city of Lockport except the second district of the second ward, which Seaman captured by the narrow margin of two votes. Lockport gave Lee 5,647 to 2,631 for Seaman, a majority in the "home town" of 3,016.

Niagara Falls and North Tonawanda, which went Democratic for Governor Lehman, returned majorities for Lee, although the vote was close in the latter city, Lee winning by only 60 votes. He received 2,215 to 2,155 for Seaman. Democratic candidates for member of assembly and welfare commissioner carried this city on the county ticket.

At Niagara Falls, Lee polled 9,233 votes to 6,565 cast for Seaman, a majority for Lee of 2,668.

Senator Lee carried every one of the twelve towns in the county, including the town of Royalton, in which Middleport, Seaman's home town, is located. Royalton went to Lee by 463 votes. He received a majority in every one of the five Royalton districts.

Status of Newsprint Code

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 14, 1934—There are all kinds of rumours afloat in connection with the status of the newsprint code on which hearing was held here many weeks ago.

There have been very definite stories both in New York City and here to the effect that the newsprint code was before President Roosevelt and that he had recently appointed a special committee himself to look into the matter outside of the NRA. The report was to the effect that this committee had completed its work and that its report was now before the President.

In this connection a question was put to the President at his most recent press conference and he denied any knowledge of the code.

This code went forward from the paper division of NRA to the Divisional Administrator a long time ago. Just recently, it is reported, the Divisional Administrator forwarded the code, with recommendations to the National Recovery Board. Technically that code is before the Board now but apparently not for immediate action. It is stated that the Board asked for a report on the code and that may have lead to the understanding that the President had asked for such a report. At any rate officials of NRA, when asked, stated that the newsprint code was before the Board for action. When this may be taken no one would even hazard a guess.

George A. Cruse With Stora Kopparberg

George A. Cruse has become associated with the Stora Kopparberg Corporation, 230 Park avenue, which represents Stora Kopparbergs Bergslags Aktiebolag, of Falun, Sweden, one of the leading industrial concerns in that country manufacturing such products as wood pulp, newsprint, iron and steel, etc. Mr. Cruse was formerly connected with the Riegel Paper Corporation in the capacity of purchasing agent, prior to that having been with the *Wall Street Journal*. He is a graduate of the University of Pennsylvania and a resident of New York City.

Paper Men At Hearing on Proposed Reciprocal Agreement With Sweden Oppose Changes

[FROM OUR REGULAR CORRESPONDENT]

Washington, D. C., November 13, 1934.—At the hearing held on Monday November 5 before the committee for Reciprocity Information in connection with the proposed reciprocal trade agreemnt with Sweden, which was briefly reported in the PAPER TRADE JOURNAL last week, the following statements were presented by representative members of the industry opposing any changes in the existing provisions for paper and pulp:

Paper in General

S. L. Willson, president of the American Paper and Pulp Association, spoke as follows upon paper in general:

The American Paper Industry is desirous that no changes whatever be made in the existing provisions for paper and pulp which would apply to other nations as well as Sweden. It is particularly desirous that no guarantee be made to Sweden that the United States will not utilize existing provisions of law, such as the Anti-Dumping Act, and Section 3 (e) of the Industrial Recovery Act, to prevent unfair foreign competition, should conditions arise which would necessitate some such action.

The position of the American Paper Industry on these and other phases of the situation are discussed in more detail later in this statement.

In view of the fact that Sweden already has a large credit balance with us in its export and import transactions, the American paper industry cannot see any reason for changes in existing relations in the field of paper and pulp. In 1932, Sweden's exports to the United States were $7,000,000 in excess of her imports of American goods. In 1933, this trade balance increased to $12,000,000. Sweden's exports to the United States totalled $31,000,000 in 1933, of which $26,400,000 represented sales of pulp, paper, paperboard and paper products. Of this twenty-six million dollars, *less than one-half million was in dutiable merchandise.* Changes in duty rates, therefore, would involve a business in dutiable papers of less than $500,000 and these are papers which are already being sold the United States at prices below those which the American mills can meet without loss.

It is significant that the Swedish credit balance increased during the year when foreign exchange conditions were altered to the disadvantage of Sweden, as compared with the previous year when exchange was in her favor.

There is no reason for any agreement affecting changes in existing conditions in the pulp and paper field. Sweden buys only necessities here, but what she sells us is largely at the expense of the American Pulp and Paper Industry. In view of Swedish trade with the United States, any changes should be to restrict present competition, certainly not to broaden this market to the Swedish producers. Yet the American industry does not ask further restrictions, but merely that present conditions remain unaltered.

The paper industry is one of the great industries of the United States. Its normal annual production amounts to over ten million tons of paper and paperboard, with a value of upward of one billion dollars. It is an industry which must operate at a high percentage of its capacity if it is to produce paper at a profit. The capital investment is about one billion dollars. Its annual turnover, compared with the capital investment, is about one dollar of product for each dollar of investment. Most other basic industries produce from two to three dollars annually for each dollar of investment. A reduction of operation, therefore, means infinitely more to the life of the Paper Industry than to almost any other important American industry.

Paper is one of the indispensable requirements of present civilization, and is particularly so in the United States, which not only uses more paper than any other nation, but which has a per capita consumption nearly half as large again as that of any other country.

Our production of paper is greater than that of any other nation, yet European nations and Japan as well are equipping their mills with high production paper machines of the type perfected in this country. With modern machinery, operated by workmen receiving no more in a week than our employees are paid for a day, these countries are able to deliver paper here, even with present duty rates, at less than American cost of production.

Furthermore, these competing paper-making nations are also capturing the world market of countries which are not self sustaining in their production of paper. We have had markets in the Orient. Japan is shipping paper not only to our former markets in the Far East, but to our own shores. Practically the only export market we have now, and that totals less than two percent of our production, is in South and Central America, and in the Caribbean. And even here foreign competition is threatening what little has remained to us of a once important export trade. It is for such reasons as these that the American Paper Industry is so deeply concerned at the additional prospect that the market we now have may be further opened to producers in other countries.

The American paper industry is peculiarly sensitive on the point of reciprocity. The entire industry is still suffering from the effects of an experiment in reciprocity made some twenty years ago. When Canadian reciprocity was being discussed, newsprint was the subject of negotiations. The outcome was that this commodity, formerly dutiable, was placed on the free list. At that time the United States mills were supplying some 80 percent of the nation's requirements. What the transfer of this paper to the free list meant is shown by the fact that today Canada is supplying two-thirds of our requirements, Europe a considerable proportion, and the American mills which formerly produced this paper were forced into the production of other grades, causing an excess capacity in other fields, which the American market has never been able to absorb.

Today, the mills which still produce newsprint are doing so at a loss—this can not continue indefinitely. It seems to have been demonstrated that newsprint can be made from our native woods, equal in quality to the imported product. Yet with a commodity selling at a price less than the cost of production, in Canada as well as in the United States, all incentive toward the development of the domestic newsprint industry is destroyed. With this lesson before us, and with the entire paper industry still suffering from its effects, our attitude toward another such experiment can be well understood.

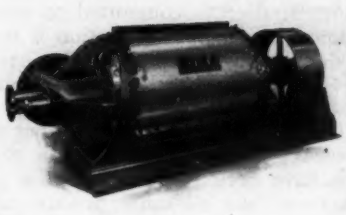
Our attitude toward the proposed trade agreement with Sweden is not based solely on fear of Swedish competition.

PAPER TRADE JOURNAL EDITION

MACHINE ROOM NEWS

WHAT THE MILLS ARE DOING TO MAKE BETTER PAPER AND MORE OF IT — AT LOWER COST.

BIRD MACHINE COMPANY • SOUTH WALPOLE, MASS.



PULP SCREENING COSTS DOWN 25%

Marked interest is being shown in the Bird Slotted-Plate Pulp Screen not alone because of its amazing capacity—25 tons a day or more—or its ability to produce high quality stock, but because of its possibilities as a cost reducing unit. Much lower first cost, operating and maintenance cost plus the saving in floor space make a 25% cut in pulp screening costs a decidedly conservative estimate. Savings in many mills may be considerably greater.

CALENDER DOCTORS NOW OPERATE CONTINUOUSLY

No longer is it necessary to run calender doctors intermittently to save the rolls and keep them from heating. Using them only for threading the paper and cleaning up after breaks means calender marks, scales, rejects. Vickery Doctors will not score. They keep the rolls continuously in perfect condition, make your investment in expensive rolls 100% productive.

USING WHITE WATER IN SHOWERS—SAVES FIBRE AND WATER

Mills using Bird Self-Cleaning Shower Pipes experience no difficulty in using white water instead of fresh water on machine, screen, washer or save-all showers. The Pipe is automatically cleaned by a simple shift of a handle. The reduction in fresh water consumption is tremendous—around a thousand gallons per day per inch of shower length.

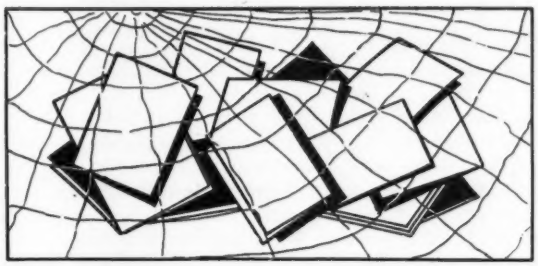
FIBRE RECOVERY NOW PART OF PAPERMAKING PROCESS

Up-to-date mills now consider a closed white water system essential to efficient, economical operation. Lowest cost fibre recovery is obtained by using a Bird Save-All System which takes care of the white water as it leaves the paper machine, removes a high percentage of the suspended matter and returns it to the machine for immediate re-use, the effluent being used in the showers.

Bird Save-All advantages include lowest first cost, negligible operating cost, no effect on color or loss on changes, no auxiliary equipment or adding of stock at the Save-All.

80% MACHINERY OBSOLETE DECLARES INDUSTRIAL AUTHORITY

"Advances and improvements in mechanical equipment have never been more rapid than in the past five years," says one prominent industrialist. "Manufacturers cannot longer afford to operate old, out-of-date equipment in view of the really tremendous operating and cost advantages that can be proved for modern machinery."



Often Sampled Seldom Sold!

Today's demand is for a sheet that is spotless. Buyers no longer tolerate specks, shives and spots. Paper salesmen find Centrifined paper a lot easier to sell. Paper that isn't Centrifined gets left on the shelves.

From the mill standpoint, the reduction in seconds and rejects and the decreased sorting expense often pays for a complete Bird Centrifiner installation.

If you're attempting to compete in today's market without Centrifined paper, you may be working under a needless handicap. Let us give you the facts about the new and lower cost Bird Centrifiner.

6184

Such an agreement with Sweden, involving more favorable treatment of her pulp and paper industry, would have more serious indirect results than the agreement itself. We understand that any nation with which the United States has a most favored nation treaty, would benefit equally with Sweden in any concessions that might be granted. We understand further that nations without most favored nation treaties may, in the judgment of the President, be given these benefits also, unless he finds there is discrimination against us. Duty reductions in the Swedish trade agreement, therefore, would be almost world wide in their effect on the American industry.

Sweden's production costs are higher than those of most other European countries. The production cost of paper in Finland, for example, is materially less than that of Sweden. There is no grade of paper produced by Finland which is not available to American purchasers at prices less than those for the Swedish product. The situation as to Norway is intermediate between that of Sweden and Finland. Germany has in past years been a heavy shipper of papers also made in Sweden.

In this discussion we have pointed out the need of the industry for a continuance of the present equitable rates of duty. The nation is in a state of economic flux. We do not know what may be forced upon us as a nation in the next three years, what steps may be necessary to assure a return of national prosperity. Present legislation permits various steps to prevent our domestic interests from being victimized for the advantage of foreign manufacturers. Various restrictions may be imposed through the Tariff Act, when and if the need arises. The Recovery Act provides, in Section 3 (e), for action by the President when he finds foreign merchandise is being imported into the United States in substantial quantities or increasing ratio to domestic production of any competitive article or articles and on such terms or under such conditions as to render ineffective or seriously to endanger the maintenance of any of the codes approved under the Recovery Act.

The Anti-Dumping Act provides a protection against unfair raids on our markets by foreign producers. Unfair competition when demonstrated, can be met by prescribed steps by the President. We do not know what may develop in the field of economics, such as foreign exchange against our dollar.

While firmly believing that we are on our way out of the depression, we are equally firm in our belief that no trade agreement with any nation should contain any guarantee that will inhibit the President from taking any of the steps now afforded by existing law to meet emergencies not now foreseen. In view of past experience we firmly believe that our country should not mortgage its future to foreign interests by any pledges to deprive itself of defense against that which may happen.

The program of the President for industrial recovery through the National Industrial Recovery Act has had no more loyal support from any industry than has been given by the American paper manufacturers. Before the Act was drafted, with a belief that some such step would be taken, the paper industry began the reorganization of its trade associations, to be ready to proceed in accordance with whatever form the proposed legislation might take. Wages were increased before the Recovery Act and its resultant codes were formulated. Throughout the period since this program was initiated the paper industry has conformed to the Administration's program. Today the paper industry is employing more workers than at any time in its most prosperous days, and many mills are paying a wage rate higher than that required by their own codes. The general paper industry code is a central codification of twenty-four divisional codes representing all domestic manufacturers in those branches of the industry. However, it is not our belief that the National Industrial Recovery Act was written to produce prosperity abroad, at the expense of American workmen.

Today, with more workers employed, with the paper mills operating at about half their normal capacity, there can be no assurance of continued payment of these wages unless production rises to a point where the high overhead for partial operation is reduced by volume of production. If foreign paper is allowed to invade our markets at prices which make profitable operation impossible for the domestic mills, the present burden will become intolerable.

The present Administration is committed to conservation of natural resources. In this connection it is interesting to note that the American Paper Industry has taken the lead among all American industries in its demand for the development of a national forestry program, one which would utilize idle land, not only for recreation, but for the production of a constant supply of its own basic raw material. Paper mills have been responsible for a greater amount of reforestation than all other private interests combined. This is an expenditure looking to no return within this generation. If the financial development of the industry is choked, the mills cannot afford to expend their capital on such long term projects, much as they wish to continue this program.

The paper industry does not ask for a high protective tariff. It has taken the consistent position, which it still maintains, that it does not seek the exclusion of foreign merchandise, but it does believe it has at least an equal right with the foreign producers to its own American market. It is in view of this general situation that the paper industry gives details herewith as to specific items of present or potential exports, and the relationship of the tariff to the continued operation of our American mills in the face of destructive competition which now exists even at the present rates of duty.

Fine Papers

American manufacturers of fine papers are opposed to any reduction of the present rate of duty on such papers, which are provided for in Paragraph 1407 of the Tariff Act of 1930.

Further, these manufacturers are particularly opposed to any foreign trade agreement with Sweden containing any guarantee which would prevent the invoking, if necessary, of any of the existing provisions by which this Government can restrict undue or unfair foreign competition. We refer to such provisions of law as the Anti-Dumping Act, Section 3 (e) of the National Industrial Recovery Act, and others of a similar character.

Sweden does not ship any papers of the so-called fine paper group to this country, but it does purchase such papers as writing papers of rag content in other countries. While Sweden ships some twenty-five million dollars worth of pulp and paper to the United States, it buys none of our paper products. In view of the large export market which we already afford Sweden's coarse paper producers, it would seem equitable that Sweden make it possible through favorable tariff actions for us to supply some of the fine paper which we produce and which she must import.

On the other hand, Sweden is equipped to produce sulphite bond, writing and similar papers, which form a very large part of the requirements of the American business world. Mills producing this paper are located in many parts of the United States, from the Atlantic to the Pacific Coast, and the investment in plants equipped to produce this grade of paper totals many millions of dollars. A reduction of duty rates on these papers would greatly impair

STURTEVANT MILL CO

HARRISON SQ., BOSTON, MASS.

Bale Pulper

TRADE NAME

PROTECTED BY U.S.PAT.1,910,392 AND FOREIGN PATENTS. OTHER PATENTS PENDING

It is Not a Shredder

It Thoroughly Defiberizes All Kinds of Baled Sheet Pulps

Where dry pulp is used, the Bale Pulper, installed before beaters, will greatly increase present beater capacity. In one mill it replaced five beaters. For toweling, blotting, impregnation work, or bleaching, only light brushing out in Jordan is necessary.

The Bale Pulper before Beaters, will develop your stock more, and thereby increase machine speed. A saturated surface "Combing Action" prevents "fish eyes" and reduces power load.

Poirier Weight Governor

is a most efficient device for controlling volume at the stuff-box.

It automatically controls weight of pulp at any predetermined amount, operating equally well on both light or heavy stock, on changed filler content or freeness. It corrects faulty chest agitation.

It is very simple, has few parts, and requires no dilution water and its attendant constant head box. It requires no piping, nor troublesome valves or floats.

SEND FOR COMPLETE INFORMATION

our industry's efforts to prevent their sale at less than cost of production.

Newsprint

That the American Newsprint manufacturers object to any provision in the proposed reciprocal trade agreement with Sweden which will alter existing conditions was the statement made before the Committee for Reciprocity Information by Edgar Rickard, Chairman of the Association of Newsprint Manufacturers of the United States, at the hearing on the pending agreement. Mr. Rickard spoke for all the domestic producers, not only on the basis of his position in the domestic organization, but with the background of his experience as president of Pejepscot Paper Company, one of the oldest paper companies in Maine.

"Practically every pound of newsprint paper imported from Sweden," he said, "since 1920 has been at a price at least $5 below the domestic price, and in some instances $10 below that price. While consumption of newsprint paper in the United States decreased 28 percent between 1929 and 1933, importations from Sweden nearly doubled. Swedish exports which were 18 percent of the Swedish total production in 1928 increased to 26 percent in 1933. There is therefore no reason for giving Sweden any further advantages in our domestic markets.

"For the past year the Newsprint Industry of the United States has been working under a Code approved by the National Recovery Administration, and has pending a plan for the stabilization of the industry, in the interests alike of the producers, consumers and labor employed in its production.

"It is of the utmost importance that the proposed trade agreement with Sweden should contain no provision which will in any way impair the ability of this industry to take such action as may be necessary to protect its existence. We ask no change in existing conditions. We do believe that on the other hand the United States should not waive any sanction which it might apply under existing law to secure the enforcement of the provisions of codes or industry agreements which are necessary to the stabilization of the domestic industry."

Kraft

Marvin H. Preston speaking on kraft wrapping paper said:

The manufacturers of sulphate wrapping paper, commonly known as kraft, oppose any proposal to lower the present rate of duty on this commodity, which is dutiable at 30 percent under Paragraph 1409 of the Tariff Act of 1930, as paper not specially provided for.

Further, these manufacturers are particularly opposed to any foreign trade agreement with Sweden containing any guarantee which would prevent the invoking, if necessary, of any of the existing provisions by which this Government can restrict undue or unfair foreign competition. We refer to such provisions of law as the Anti-Dumping Act, Section 3 (e) of the National Industrial Recovery Act, and others of a similar character.

The competition of Swedish kraft wrapping paper, used for wrapping, for the making of bags, and conversion into other commodities, is so serious that the domestic kraft paper industry has filed a complaint with the Imports Division of the National Recovery Administration, asking a revision of present tariff rates upward.

The Treasury Department on September 25, 1934 (T.D. 47,272), ruled that Swedish kraft wrapping paper is not being dumped in this country. Apparently this ruling was on technical grounds, under the Anti-Dumping Act, for the United States Court of Customs and Patent Appeals last spring decided that the Swedish paper was being undervalued (T.D. 47,210, May 31, 1934).

With Swedish paper of this type sold to American consumers at prices which the highest Customs Court has found to be less than the home market price, and with duty collected since 1930 on the higher value, pending the Court decision, the paper has continued to be sold at less than the American cost of production.

Swedish paper of the type imported to this country is known as machine glazed. Importations are in tons about 10 percent of the American production of this kind of paper. The serious phase of the situation, however, is that the low prices on Swedish machine glazed kraft serve to depress the market for the American-made product, and this in turn, owing to accepted differentials between this quality and the more commonly used machine finished kraft, places a price pressure on the great volume of domestic machine finished kraft.

With this situation, and with the American industry already asking for a revision of the duty on kraft wrapping paper upward, we hope that the plans for a reciprocal tariff agreement with Sweden do not contemplate any reduction in the rate of duty now effective, particularly as such a reduction would also apply to shipments from Finland where the cost of production is even less than in Sweden.

Details of the situation as to this paper are a matter of record and are available to you as follows:

Decision of the United States Court of Customs and Patent Appeals, Treasury Decision, No. 47,210, May 31, 1934.

Data as to the complaint of dumping, on file in the Bureau of Customs.

Sulphite Wrapping

George Stuhr, of the Continental Bag and Paper Corporation, had the following to say in connection with sulphite wrapping paper.

The manufacturers of sulphite wrapping paper oppose any reduction of the duty on this commodity in the proposed Trade Agreement with Sweden. The present duty rate, inadequate to equalize the American selling price of the foreign paper with the cost of domestic paper of comparable grade, is 30 percent, under Paragraph 1409 of the Tariff Act of 1930, as wrapping paper not specially provided for.

Further, these manufacturers are particularly opposed to any Foreign Trade Agreement with Sweden containing any guarantee which would prevent the invoking, if necessary, of any of the existing provisions by which this Government can restrict undue or unfair foreign competition. We refer to such provisions of law as the Anti-Dumping Act, Section 3 (e) of the National Industrial Recovery Act, and others of a similar character.

Even under present conditions, the competition from Sweden is so serious that American manufacturers can not meet the price of the foreign commodity. The chief competition is in Machine Glazed wrapping paper, used for wrapping paper and for conversion into Shopping and other bags. The foreign paper is delivered in this country, duty paid, at $3.50 per hundred pounds, which compares with American costs of production ranging from $3.80 to $4.50 per hundred pounds, according to quality. The Swedish paper sold at $3.50 is comparable to the domestic grade which costs approximately $4 per hundred pounds to produce. Because of this situation, the domestic industry took steps to secure action under the Anti-Dumping Act in 1932. The investigation of this complaint by the Bureau of Customs has not yet, as far as we know, been completed.

The situation as to the competition on this paper is more serious to the domestic producers of all wrapping

Noble & Wood PROPELLERS

Speed up hydration

Circulate high density stock

Step up beater output

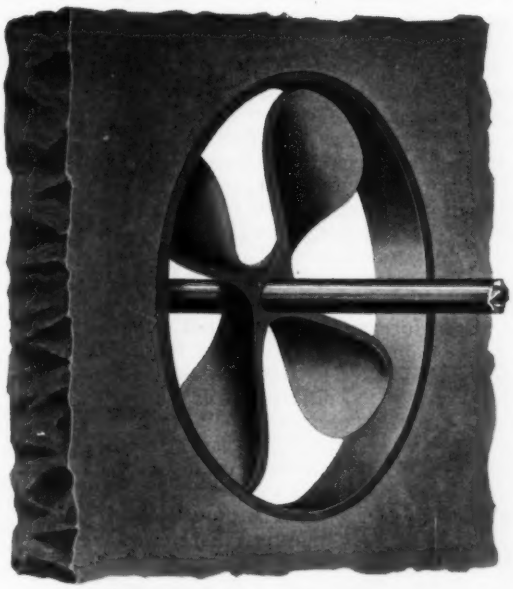
Produce constant, thorough agitation

Blend stock uniformly

Mix colors quickly, completely

Better Paper—*faster*

with Noble & Wood Propellers



Noble & Wood propellers properly applied, will probably do more to step up your production and quality of paper than any other single piece of equipment.

They increase the beater capacity by faster circulation of stock, by handling greater volumes of heavier density stock than is possible with the beater roll alone. With Noble & Wood propellers, hydration; mixing of colors, fillers and size is more rapid, more uniform, with a consequent better quality sheet. In stock chests, these propellers keep the stock in constant motion. They give you uniformity of hydration, color, density, with no change in fibre formation. Subsequent drops are promptly and completely mixed with the stock already in the chest, avoiding the settling or stratification often found in chests with inferior agitation.

Noble & Wood propellers are used in pre-hydration systems, fast circulating and high density beaters, in machine, drop and storage chests, in mixing engines and cookers—wherever stock must be circulated, hydrated, mixed, colored or kept in suspension.

They are easily applied to all types of installations—can be added to existing equipment without difficulty or undue expense. Let us show you where you can use Noble & Wood propellers to advantage.

The Noble & Wood Machine Co.

Hoosick Falls, N. Y.

papers than would appear on the surface. Current records of imports do not indicate the true danger of this competition.

It is a fact that after the initiation of the dumping complaint, sales of the imported paper fell off sharply. Imports were 50 per cent less in 1933 than in 1931 and 1932, as the importers feared they would be required to pay a dumping duty of about 1 cent per pound in addition to the normal duty of 30 per cent. As time went on and no action was taken on the dumping complaint, the competition was revived. Also, the importers rushed to take advantage of the higher market prices which resulted from the domestic codes which forbade American producers to sell at less than cost. Despite an adverse shift in foreign exchange, imports in the first six months of 1934 were more than double the volume of the same period in 1933, both as to tonnage and dollar value, and are increasing. The imports now amount to about 6 per cent of the domestic production, at all prices below American production costs. One important mill has been almost entirely driven out of the field as it can only find a market, due to the low prices caused by foreign competition, at 10 cents per hundred pounds below the cost of production.

The damage caused domestic producers by loss of business and the depression of prices for comparable domestic paper is more far-reaching than would be apparent at first glance. The price of the foreign machine glazed sulphite paper has a direct effect on the prices of the domestic paper of that grade. However, the effect is more widespread, for there is an understood differential in the trade between the machine glazed paper and the machine finished grade, by which the so-called "M.G." paper sells at a price above that of the "M.F." Price cutting on the "M.G." has an indirect, but no less definite effect on the "M.F." production, which is produced in much larger quantities. The opening of our market, therefore, to lower priced Swedish Sulphite paper will not only cause a diversion of business from American to Swedish mills in the "M.G." field, but will also have a detrimental effect on the balance of the sulphite industry. The effect will be loss of business, and eventually a danger that the domestic mills can not operate at prices which will enable them to pay the high labor costs now being paid without protest in accordance with the Code of the Sulphite Paper Manufacturers Division of the Paper Industry Authority.

When this Industry appeared before the two Houses of Congress at the time the Tariff Act of 1930 was being written, the following statement was made:

"It is not the intent or purpose of the Industry to seek from The Congress either classification or rates which will absolutely prevent the importation of competitive products, nor to ask for protection where no protection is needed. This Industry can justify by facts every change which it seeks.

"It does not guess with respect to foreign competition. It knows and knows accurately of this competition, and where it is encountered, and it earnestly asks to be accorded the protection sought herein, and which is necessary for the continued existence and prosperity of this vitally important Industry."

This position this industry still maintains. It believes in such rates of duty as will serve to equalize the delivered duty paid price of foreign merchandise with American cost of production. It asks no more, but must have this protection if it is to continue to operate and pay an American standard of wages to its employes.

Statement by D. T. Lawrence

D. T. Lawrence, representing the Trunk Line Association, said:—

The paper making industry located in the middle states, particularly in the western part of the lower peninsula of the State of Michigan, consumes large quantities of imported wood-pulp coming chiefly from Sweden. The American railroads are naturally desirous of transporting this traffic from North Atlantic ports to the points of consumption but much of it has been moving via vessel from Sweden to the Canadian port of Montreal for trans-shipment there to vessels which carry it through the St. Lawrence River, the Welland Canal and the Great Lakes to United States lake ports, particularly to the port of South Haven, Mich. My preparation of this statement has been hurried and I have had no opportunity to get figures as to the volume but it amounts to many thousands of tons per annum. Figures taken from customs statistics would not reveal the volume of this traffic from Sweden transshipped at Canadian ports because the figures would also include some traffic originating elsewhere than in Sweden and some traffic transported from foreign ports to United States lake ports by direct sailings without trans-shipment.

If this wood pulp could be brought to the North Atlantic ports of the United States, the American railroads would have a much better opportunity of transporting it and they would therefore favor a requirement in your trade agreement with Sweden which would encourage such routing of the traffic, whether this be done by requiring the use of vessels of United States registry or the discharging of traffic from trans-Atlantic vessels at United States ports, or otherwise.

The railroads serving the United States North Atlantic ports have observed for a long period of years successful efforts of the Government of the Dominion of Canada and the Canadian railroads to encourage the movement of Canada's overseas imports through Canadian ports as against United States ports. The railroads have considered making representations to a Committee of the Senate with respect to the so-called White Bill, S-3516, introduced in the Senate in February, 1932, by Senator White, but had reached no decision to take definite action in this matter because they have preferred not to advocate measures which might be unwelcome to the State Department. They now make their representations directly to the State Department.

In the year 1901, 29.7 per cent of Canada's overseas imports were transported through United States ports. There has been an almost continuous decrease in this percentage from year to year until in 1932 the figure was 2.2 per cent. These figures from 1901 up to 1928 are taken from page 32 of a message from the President of the United States to Congress, dated January 29, 1929, 70th Congress, Second Session, Senate Document No. 212. The figures for the years 1929 to 1932 have been computed from statistics published in the Canadian Government publication, Canada Yearbook, as were the figures shown in the message from the President of the United States.

In the Canada Yearbook for 1933, at page 501, it is stated that between 1920 and 1932 imports via the United States have decreased from 9.5 per cent to 2.2 per cent of the total imports from overseas countries, and on the same page this decline in imports via the United States is attributed to (a) provision in trade treaties and agreements that goods must be imported direct to obtain the full benefits of tariff concessions, and (b) additional concession on goods imported direct under the preferential tariff. On the same page showing a contrary tendency with respect to exports from the Dominion of Canada to overseas countries, we find the following: "the proportion of exports from Canada to overseas countries via the United States

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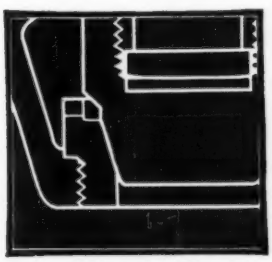
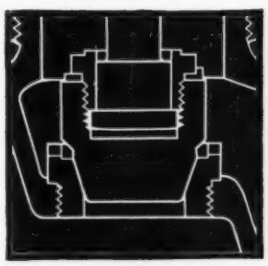


Angle and width of seating surfaces are *exactly right* to insure free operation and long life.



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shows a slight decline since 1927, the percentages for the last eleven fiscal years being:

1922, 32.8 per cent	1928, 38.9 per cent
1923, 41.1 per cent	1929, 36.7 per cent
1924, 36.2 per cent	1930, 33.8 per cent
1925, 39.3 per cent	1931, 27.5 per cent
1926, 39.2 per cent	1932, 18.7 per cent
1927, 39.5 per cent	

We are unable to find reliable statistics as to the volume of overseas imports into the United States through Canadian ports or overseas exports from the United States through Canadian ports. The volume of traffic imported into the United States through Canadian ports is believed to be several times as great in dollars as the volume imported into Canada through United States ports. That this traffic is encouraged to an extent which we think is undue is shown by a statement on page 33 of the message from the President of the United States, mentioned above. This statement shows the first class and fifth class import rail rates from various Canadian and United States ports to Chicago, Ill. The situation at Chicago is illustrative of the situation to and from points generally west of the Detroit-St. Clair frontier. The rates have been changed somewhat since the message from the President but their relation has remained undisturbed. The first class rates are illustrative of the basis. The base rate is from Baltimore to Chicago, 797 miles, $1.40. Philadelphia, 817 miles, has a rate 2 cents higher than Baltimore. New York, 909 miles, and Boston, 1033 miles, have a rate 8 cents higher than Baltimore. Halifax, 1607 miles, and St. John, 1329 miles, have the Baltimore rate. Montreal, 841 miles, 24 miles in excess of Philadelphia, has the Baltimore rate, 2 cents less than the Philadelphia rate. The export rates in the reverse direction are slightly different. Eastbound Montreal has the Philadelphia rate and St. John and Halifax have the New York rate for their much greater distances.

To and from Halifax and St. John this adjustment seems to the American railroads to be very unfair and to the best of our knowledge and belief, the influence of the Canadian Government is the reason for the maintenance of such a basis by the Canadian National Railways and the Canadian Pacific Railway. United States railroads are unable to correct their situation since the Canadian National Railways through their control of the Grand Trunk Western Railroad reach directly such cities as Detroit, Grand Rapids, Milwaukee and Chicago.

An example of Canada's effort is found in its treatment of imports of bananas. Formerly a considerable movement of bananas for Eastern Canada took place through United States North Atlantic ports but in May, 1929, a change in regulations diverted substantially the whole movement to Canadian ports. Our understanding is that a tax of 50 cents a stem is imposed by the Dominion of Canada on all bananas imported except those coming from British Empire territory through Canadian ports. Thus, bananas from the British West Indies or British Honduras may go into Canada free through St. John, Halifax or Montreal but bananas from other Central American countries, the Canal Zone or Colombia imported in any manner and bananas from British Honduras or the British West Indies imported through United States ports are subject to a tax of 50 cents a stem. Eastern Canana draws its bananas from British territory through Canadian ports, and when the port of Montreal is open some of those bananas come through Canada into the markets of the United States, and compete without customs handicap with bananas brought through United States ports.

Another instance of Canada's effort is found in the situation as to export wheat from Canada. Formerly great quantities of export wheat from Canada moved by lake to Buffalo and from there was exported through United States North Atlantic ports. A trade agreement between the members of the British Empire imposed a duty of two shillings per quarter (approximately 6 cents per bushel) on wheat imported into Great Britain from non-British territory. The British Government does not construe this as prohibiting the free entry of Canadian wheat when transported through United States ports but it imposes such meticulous proof as to the sale in Canada for export and the identity of the wheat exported as to constitute a severe handicap against the route through Buffalo and United States ports.

American railroads do not adversely criticize Canada's successful efforts to encourage British and Canadian shipping and Canadian ports and railroads, but they believe the United States should pursue a similar policy as to its shipping, its ports and its railroads. No Governmental restriction now exists against importation of overseas traffic into the United States through Canadian ports.

Other information filed with the committee by the paper delegation included the following:

Printing Papers

The American manufacturers of papers covered by the provisions of Paragraph 1401 of the Traffic Act of 1930 are opposed to any change in the present rates of duty on these papers.

These manufacturers are particularly opposed to any foreign trade agreement with Sweden containing any guarantee which would prevent the invoking, if necessary, of any of the existing provisions by which this Government can restrict undue or unfair foreign competition. We refer to such provisions of law as the Anti-Dumping Act, Section 3 (e) of the National Industrial Recovery Act, and others of a similar character.

Paragraph 1401 is so comprehensive that it covers the entire field of printing papers, including many special papers, but particularly three chief groups:

1. Groundwood papers, containing a large proportion of groundwood or mechnical pulp.
2. Uncoated book paper, chiefly of soda or sulphite pulp, with only a minor percentage or no mechanical pulp.
3. Text paper, a higher grade of book paper, used for high grade books and other printing purposes.

Under the Code organization of the paper industry, these chief groups of printing paper are in two separate subordinate codes of the general code, administered through the Paper Industry Authority.

The groundwood paper manufacturers are in the Ground Wood Paper Manufacturers Association; the uncoated book paper and text paper manufacturers in the Book Paper Manufacturers Association.

The present tariff rate is equivalent to an ad valorem duty on the ordinary book papers of approximately 15 per cent. On the groundwood papers the rate is equivalent to from 15 to 20 per cent, while on the higher grades the duty is materially less than 15 per cent. The duty rates on these papers are among the lowest duty rates imposed in any part of the paper schedule of the existing Tariff Act.

In the case of Sweden, the domestic industry is chiefly concerned with the groundwood and book grades, as these are the type chiefly produced in that country.

The relationship of printing papers to the tariff involves conditions that can not be considered from a quantitative relationship of tonnage produced here and imported. In no part of the Paper Industry is the balance between foreign and domestic production so delicate.

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A very slight change of the present protective rates would serve to transfer the market for this paper from United States to Canadian mills. Our concern as to the proposed trade agreement with Sweden is less because of a fear of a flood of imports from Europe, than the result on the North American situation.

The situation at present is almost a direct parallel to that which existed when newsprint was placed on the free list. The industry moved immediately to Canada. No such shift of markets has ever been known in any major American commodity. The danger of the same result in the book paper field is no figment of imagination.

In 1910, the United States imported 25,000 tons of newsprint from Canada, none from Newfoundland, and none from Europe; during that year mills in the United States made 1,200,000 tons. In 1933, only 935,000 tons of newsprint were made in the United States, but 1,640,000 tons were imported from Canada and Newfoundland, and 153,000 tons from Europe. That is what the removal of the tariff did in the case of newsprint. If the same course is followed in the case of book and other papers, the absence of protection will cause the producers of these grades to follow newsprint to Canada. We do not yet concede that it is a proper American policy to send American dollars to Canada to build up industries operated with Canadian labor, in the production of merchandise to be sold in the United States.

Today, in Canada, we have a surplus capacity in the newsprint mills equal to at least half of the entire normal production of book paper in the United States. The highest price at which Canadian newsprint mills are now selling newsprint to the United States is about $3 per ton less than the cost of production of newsprint in this country. It would be only a matter of a short time to divert many of these machines from the production of newsprint to the manufacture of book paper comparable to the standard grades made in this country. Many of these mills are already selling dutiable groundwood printing paper in the United States at such low prices that the Code Authority established under the National Recovery Administration has authorized the domestic producers of these grades to sell their paper at 80 per cent of the cost. In other grades of paper, the present Code provisions specify in broad terms that no sales may be made at less than cost. The situation in the groundwood paper field because of foreign competition is such that special dispensation has been granted for all of 1934 to the manufacturers to sell at 80 per cent of cost pending the finding of a remedy for this condition.

Importations of dutiable printing papers from Sweden are small, but the invoiced prices of papers imported in 1933 averaged 1.4 cents per pound, hardly more than the Swedish price for standard newsprint paper. It is common report that Swedish newsprint mills guarantee their American customers a delivered price of $7 per ton below the domestic market. Whether the reports of this guarantee are correct or not, statistics show that at least this differential is represented in the Customs statistics of such importations.

With this situation existing in standard newsprint, the reason for apprehension over a reduction of the present duty is apparent. If the proposed trade agreement with Sweden provides for a reduction in the rate of duty on printing paper, the rate set for Sweden will automatically be applicable to shipments from Finland which is already delivering book paper in this country at prices, including payment of present duty and freight, less than the American cost of production. The reduction would doubtless also apply to shipments from Canada, where, as is already shown, the existing mills, with an idle capacity of more than 750,000 tons per year, can with even slight encouragement in the way of duty reduction, successfully invade the American market.

The book paper industry is one of the most important single groups in the entire American paper industry in tonnage of product and in value of output. Its production even in these distressed times is at a rate of nearly 1,000,000 tons per year. The production of fifty-two mills, on which there are complete statistics, for the first eight months of this year was 606,657 tons. These mills comprise only a part of this industry, but are presumably representative. Employment in these fifty-two mills is between 20,000 and 21,000 persons in productive labor, excluding office, executive, sales and other personnel. The average production of these mills is four tons of paper per month per employee. The wages paid these employees totaled about $1,500,000 per month, even with the industry operating far below normal.

The book paper mills purchase large quantities of materials from other industries, whose material prices represent chiefly labor. Coal, sulphur, lime, are only part of the materials needed in the production of this paper. It is safe to assume that for every three workers employed in paper mills, employment is given two persons in other industries.

The foregoing statement shows that each employee in the book paper industry produces fifty tons of paper per year. If duties are lowered so that foreign paper supplants domestic production, every fifty tons of paper imported will send one American workman to the ranks of the unemployed, and one average family of five will be impoverished. For every one hundred and fifty tons diverted from an American mill to a European producer, three workmen in an American paper mill will be deprived of employment, two in other industries, leaving twenty-five mouths to be fed from relief funds.

The ground wood paper industry, making a wide variety of cheaper grades more closely resembling newsprint, involves many millions of dollars of value of product and wages paid, in addition to the data given for the book paper industry. The situation is somewhat different, however, and in some respects more serious, for there is extensive competition already existing in the grades represented by this group. It is this group which has been forced to set a price basis of only 80 per cent of cost as its sale price, and this condition cannot continue indefinitely. Any reduction of duties on papers of this grade would destroy this branch of the paper industry. With the present rate of duty less than 20 per cent, the lowest rate provided for any paper in the entire paper schedule, it is apparent that this group can not survive if its foreign competitors are given advantages even greater than those they now enjoy.

Fiber Boards

The American manufacturers of fibre boards covered by the provisions of Paragraphs 1402 and 1413 of the Tariff Act of 1930 are opposed to any reduction of the duties provided for these commodities. The Act under which the proposed Trade Agreement with Sweden is being considered has already caused an actual reduction of the duty on plain boards of from 40 to 60 percent, according to quality. No further reduction should be even considered.

Further, these manufacturers particularly oppose any foreign Trade Agreement with Sweden containing any guarantee which would prevent the invoking, if necessary, of any of the existing provisions by which this Government can restrict undue or unfair foreign competition. We refer to such provisions of law as the Anti-Dumping

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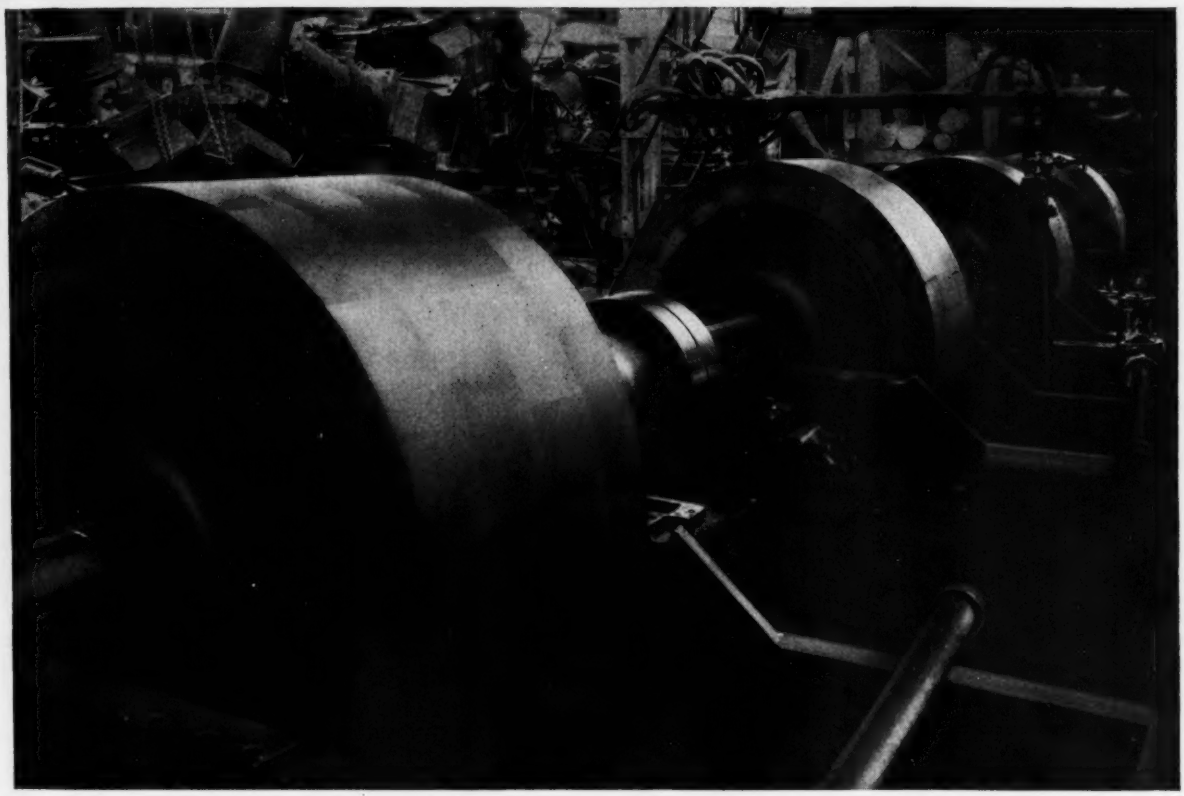

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Act, Section 3 (e) of the National Industrial Recovery Act, and others of a similar character.

The competitive situation as to unprocessed fibre board is already so serious that a complaint is on file with the Imports Division of the National Recovery Administration asking for an increase in the present duty rates. The unprocessed or plain fibre board is used for innersoles and counters of moderate priced shoes, for the manufacture of the cheaper grades of luggage and for electrical insulation. The production of this board involves a large capital investment and labor employment.

Under the Tariff Act of 1930 before it was amended by the Act approved June 12, 1934, under which the proposed Swedish Trade Agreement is being considered, this board was dutiable under the contingent duty provisions of Paragraph 1402 at five Swedish crowns per 100 kilos. This was equivalent during the first six months of this year to about $12 per ton or an ad valorem rate of from 17 percent to 24 percent depending upon the value of the board. The said amendment repealed the contingent duty provisions and the duty is now 10 percent. Sweden however has not reduced its duty.

Of the total importations of fibre board into the United States, Sweden shipped 35 percent in 1931, 32 percent in 1932, 51 percent in 1933 and 42½ percent during the first seven months of this year. Germany supplied the remainder. The latter country has been the source in the past of the greater portion of the imports of this board to the United States.

Even before the duty was reduced by the repeal of the contingent duty provisions, both the Swedish and the German product undersold the domestic product, causing unwarranted reduction in prices with consequent loss to the domestic industry.

Any further reduction in the present 10 percent duty would prove disastrous to the domestic industry and prevent compliance with Code provisions and destroy the aim aid intent of the National Industrial Recovery Act. Any reduction in the duty granted on the Swedish product would automatically apply to the benefit of Germany, which at present is the chief source of imports, and would result in increasing the burden of competition which the domestic industry would have to meet.

One of the principal grades of the domestic board is sold to the consumer at from 4½ to 5 cents per pound delivered. Similar Swedish board can be laid down, duty paid, at seaboard at from 3 to 3¼ cents per pound, and delivered to the consumer at from 3½ to 3¾ cents per pound. The foreign board is sold anywhere from 10 to 25 percent below the domestic board with a substantial profit to the importer.

Embossed and coated fibre board is almost exclusively used in the manufacture of trunks and suit cases and is dutiable at 30 percent as processed board under Paragraph 1413 of the Tariff Act. In the case of this board the competitive conditions are even more serious than in the case of the plain board, the foreign board selling as much as 40 percent below the price of the domestic board.

Wood Pulp

Although wood pulp is on the free list of the American Tariff Act, imported pulp is such an important factor in the production of paper in this country that it must be discussed in this statement. There are attached as "Exhibit A" a set of charts which graphically portray the important part which imported pulp bears in American production of paper.

Inasmuch as pulp is now on the free list, the negotiation of a treaty with Sweden can not transfer, under the terms of the law, this commodity from the free to the dutiable list. Also, international relations between the foreign pulp producers and the American producers of both pulp and paper are on a friendly basis which we all hope will not be disturbed.

Because of this present situation, we do not even consider asking at this time for any imposition of a quota on foreign shipments of this commodity to this country, and we ask no other limitations on imports of this material. On the contrary, we are anxious that the present status be maintained, and that nothing be written into this treaty which would impair the maintenance of the present situation.

While American relations with foreign nations as to pulp exports are now uniformly on an excellent commercial footing, and while the leaders of the Pulp Industry in most foreign countries are equally desirous with ourselves to continue the present situation, there is always the possibility of efforts to disturb the delicate balance which now exists by producers who are less far-seeing.

For this reason, we believe it would be of mutual advantage to both Sweden and the United States to write no language into the proposed treaty which would prevent the exercise by the President of authority now given under existing law to prevent any change in present conditions. As a means to this end, we believe that the proposed treaty should make no mention of pulp, and this would automatically leave the President free to act, if developments required by application of the Aanti-Dumping Act, the provisions as to foreign competition in the National Industrial Recovery Act, or to utilize any of the recognized provisions in existing statutes to prevent unfair foreign competition. No need for any such action is now apparent. Should the need arise from any cause, the United States should not be dperived of the opportunity to take such action by any pledges made at this time.

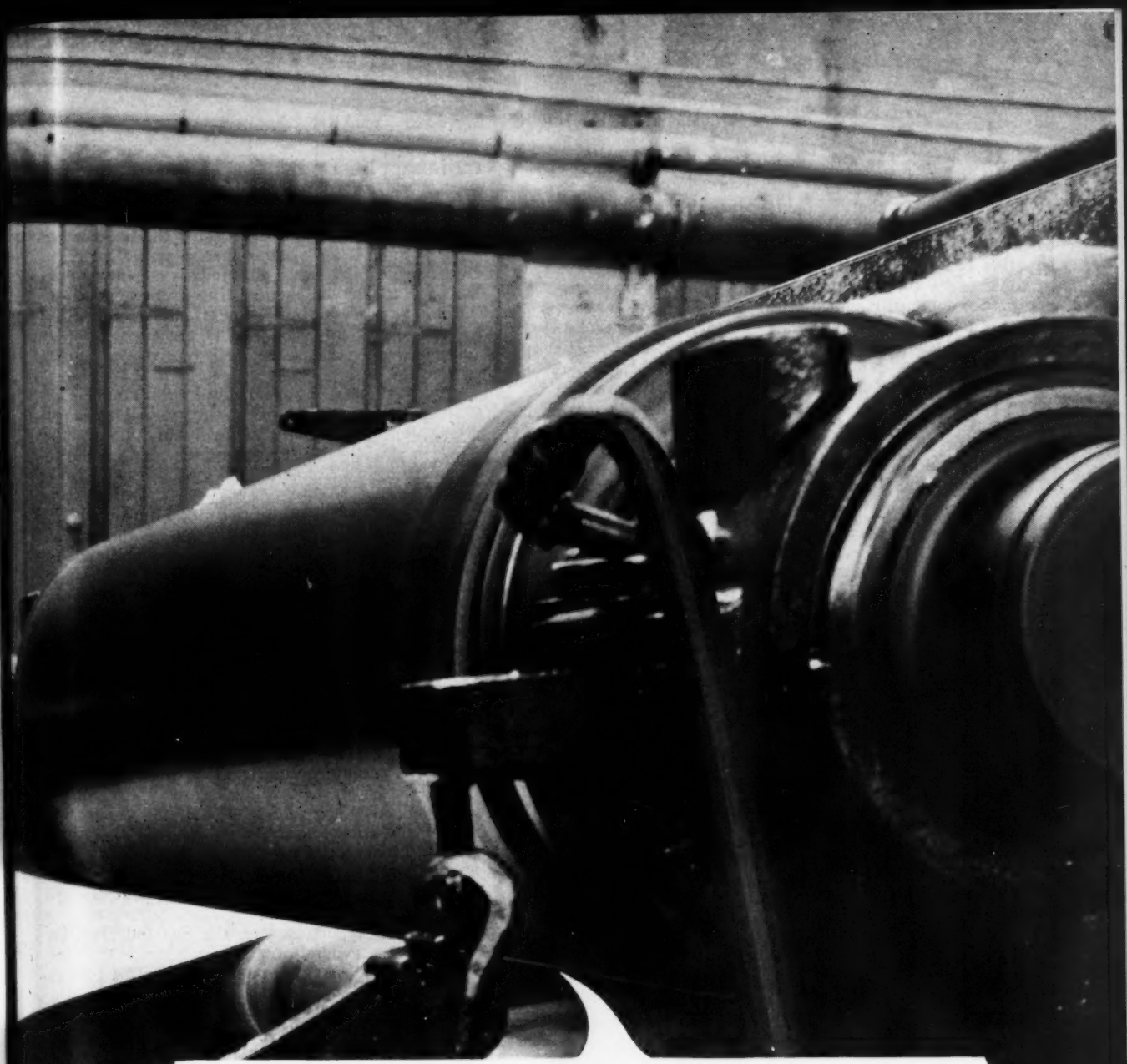
Tissue Papers

American manufacturers of tissue papers are opposed to any reduction of the present rate of duty on such papers, which are provided for in Paragraph 1404 of the Tariff Act of 1930.

Further, these manufacturers are particularly opposed to any foreign Trade Agreement with Sweden containing any guarantee which would prevent the invoking, if necessary, of any of the existing provisions by which this Government can restrict undue or unfair foreign competition. We refer to such provisions of law as the Anti-Dumping Act, Section 3 (e) of the National Industrial Recovery Act, and others of a similar character.

Sweden has not shipped any tissue paper to America this year, but it has a large capacity for manufacturing such papers. A duty reduction on tissue paper in the proposed reciprocal treaty would undoubtedly cause the beginning of competition with the domestic mills, which does not now exist. The more serious phase of this situation, however, is that a reduction of the duty on this paper in the Swedish treaty would be immediately effective on the commerce of other nations which can make this paper cheaper than Sweden, and which are already making shipments. Two such countries are Finland and Japan, both of which are producing and shipping such papers to the United States at prices, duty paid, which are below the prices of domestic paper.

We object particularly to any change in the tissue paper rates of duty at this time because it is becoming recognized that the present provisions in the Tariff Act of 1930 need extensive revision. The rates of duty on high grade paper such as carbonizing and the like, are equivalent to a very



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low ad valorem. The rates on the cheaper tissues, on the other hand, are equivalent to a high ad valorem.

We believe that there should be no alterations of the present tissue paper provisions, harmful as they now are to the high grade group of the industry, until the whole situation can be clarified. It is the belief of this group that eventually there must be a rebracketing of tissue papers under some plan which will include a higher rate of duty for papers of the type selling at prices approximating 50 cents per pound. The cheap tissues should be included in another bracket, while there should be, we believe, a third bracket for a different rate of duty on papers which are sold in some such ranges as from a minimum of 10 cents per pound to the price which may be accepted as a minimum for the high grade tissues. The present schedule may be inequitable, but a treaty with a single nation is no place for the remedy to be applied.

Greaseproof Papers

The American producers of both greaseproof papers and vegetable parchment oppose any reduction in duty on these commodities, which are provided for in Paragraph 1405 of the Tariff Act of 1930 at a rate of 3 cents per pound and 15 per cent.

The manufacturers of these papers are particularly opposed to any foreign Trade Agreement with Sweden containing any guarantee which would prevent the invoking, if necessary, of any of the existing provisions by which this Government can restrict undue or unfair foreign competition. We refer to such provisions of law as the Anti-Dumping Act, Section 3 (e) of the National Industrial Recovery Act, and others of a similar character.

There are two grades of paper of which Sweden is a large producer. One has been imported in the past in large quantities, another is not yet invading the American market.

One of these grades of paper is commonly known as imitation parchment or greaseproof paper. It is a wrapping paper in which the pulp is so mechanically beaten that the cellulose is permeated with water and the paper becomes highly grease resistant. The film of moisture prevents the penetration of oil, and the paper is extensively used in the wrapping of greasy food products. In years past the Swedish producers shipped large quantities of this paper to the United States. By reason of the present duty rate, and the development of our processes, American mills have regained a large part of this market. To reduce the duty would be to seriously affect the operations of the domestic mills.

The other grade is a higher quality paper, known as vegetable parchment, which is far more grease resistant than the imitation parchment papers. Vegetable parchment is a sheet so chemically treated that its essential character is changed, rendering it almost impervious to the most penetrating greases. It is used where the so-called greaseproof papers are not sufficiently grease resistant to meet the requirements of the consumer.

Sweden is now producing a grade of this vegetable parchment which sells at 9 cents per pound in the home market, but which is exported at a price of 6 cents. The present duty of 3 cents per pound and 15 per cent barely equalizes the price of the foreign and the domestic paper in the American market. Any reduction in the rate of duty on this commodity is feared because it would apply to other countries which can produce vegetable parchment at about the same sale price as the Swedish product. Some can produce this paper at even a lower price.

Indianapolis Looks for Improvement

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., November 13, 1934—Active preparations are being made in this area for the holiday season, which promises to be better than it was a year ago. With elections out of the way, the trade is convinced there will be a gradual improvement. Uncertainty concerning elections doubtless slowed up business, but from now until the first of the year some results are expected from the volume of inquiries that has been received during the last two weeks.

Both in coarse and fine papers, the improvement in demand for the last month has been so gradual as hardly to be noticeable, but a comparison in volume in both grades with a couple of months ago shows definitely a trend toward better conditions. Credit conditions also have shown some improvement.

Any attempt to increase the price of newsprint, which seems certain now, will meet with a lot of Indiana opposition. In some ways this is difficult to understand. All during the depression the Indiana publishers have maintained their lineage rates for the most part. Of course they suffered a loss in business, but they pared their forces, cut wages in all but the mechanical departments, which were under contract, and in other ways curtailed their expenditures. Most of the larger papers, it must be said, have restored the wages to the previous levels, or almost the previous levels. At the present time they are showing steady lineage increases.

Business is picking up considerably in building papers. Agitation for remodeling and repair work is having its effect and all the larger cities show figures with buildings much improved. Roofing and other building papers will be in good demand until severe weather halts operations. Spring should be exceptionally good.

Container factories continue to operate at nearly capacity. There is a steady market with most of them and warehouse stocks are very low.

Paper stock men report an irregular demand from the mills. There is a general low offering price on most grades, with the best rags and papers having the edge in demand.

File Information Against Paper Stock Firms

WASHINGTON, D. C., November 13, 1934—Criminal informations have been filed in two cases in the United States District Court for the Eastern District of New York against Luigi Manzoni and Vincenzo Dalto, doing business as National Paper Mill Supply Co., and against Brooklyn Paper Stock Corporation and Joseph Morana, president.

These suits are filed to restrain violation of the minimum net prices approved under the code of fair competition for the waste paper industry.

These cases were prepared by Leo J. Hickey, United States attorney, assisted by Eugene F. Roth, assistant counsel of the Litigation Division of NRA.

Parker Corning Reelected Congressman

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., November 13, 1934.—Parker Corning, president of the Albany Felt Company, is receiving the congratulations of his friends upon his reelection as Congressman from this district at the recent election. He received a huge plurality and the result was never in doubt. He has already served several terms and his splendid record in office was a large factor in the re-election.

1935 LOCKWOOD'S DIRECTORY of the PAPER & ALLIED TRADES Edition

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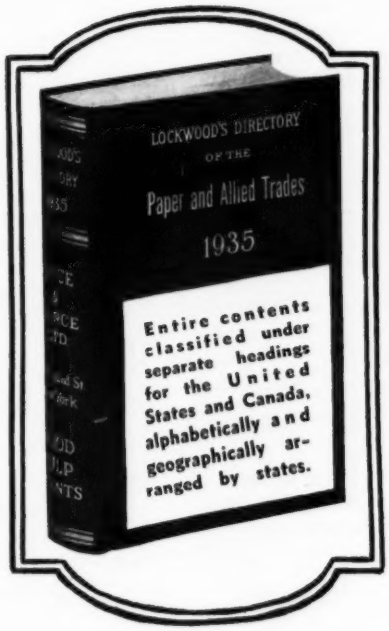
Paper Bag Manufacturers
Paper Box Manufacturers


LOCKWOOD'S DIRECTORY
OF THE
Paper and Allied Trades
1935
Entire contents classified under separate headings for the United States and Canada, alphabetically and geographically arranged by states.

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LOCKWOOD'S DIRECTORY

The new edition of Lockwood's Directory of the Paper and Allied Trades has just been issued. The 1935 edition is the sixtieth annual edition of this work.

Due to business conditions, the changes in this year's edition have again been very heavy. Although there have been few new mill entries, there have been many important and interesting changes in the Mill Section. Quite a number of idle mills have resumed operations, others have gone idle and some have faded from the picture altogether. The changes in the personnel of the various firms have been unusually numerous.

The Mill Equipment Department added to the Directory three years ago is constantly growing. It has been amply demonstrated that this is a feature of the Directory that has long been needed. It furnishes an easy and ready reference to the multiplicity of machinery and supplies needed in the pulp and paper mills. All manufacturers of such equipment and goods are eligible for listing without charge. The task of gathering all the names is, of course, a tremendous one and it is appreciated that some who are eligible may have been omitted. If such concerns will inform the publisher, their names will be gladly added to the list.

Many new entries have again been added to the section devoted to trade associations, and the officers of the old associations have been brought strictly up to date. Because of the important place that the associations have come to occupy under the NRA, this list will be found extremely useful. Owing to the constant changes that have been taking place in the various Code Authorities, this information is not given, but as the authorities and the associations are closely allied, such information can be easily obtained from the association where it is needed.

Changing conditions have made necessary more than the usual amount of revisions in all the other sections of the Directory, including the Classified List of Pulp and Paper Mill Products, the Paper Specialties Section, Glazed, Coated Paper and Board Manufacturers, Rag and Paper Stock Dealers, Rags and Paper Stock Consumed by the Mills, General Paper Merchants, Paper Box Manufacturers, Envelope Manufacturers, Papeterie Manufacturers, Pulp Testing Chemists, Office Addresses of Mills and Mill Supply Houses and the Watermarks and Brands.

New subscribers should remember that the Table of Contents on page 4 will make it easy for them to find any section in the book in which they are interested. They should remember also to read carefully the explanatory matter at the heading of each section. By doing this points that might otherwise be confusing will be clear.

The Directory is issued in two editions, the regular edition of 1111 pages and the Travelers' edition of 246 pages, including only the pulp and paper mill section. The cost of each edition is $7.50 or $7.00, cash with order.

MONTHLY DATA ON BUSINESS

Collection of detailed monthly statistics by trade associations is urged in the report of the committee on statistical reporting and uniform accounting for industry of the Business Advisory and Planning Council submitted to the chairman of the council, S. Clay Williams, and just made public. Walter S. Gifford, chairman; Pierre S. du Pont and William A. Harriman comprised the committee making the report.

Existing compilations of statistical data do not provide a sufficiently well-balanced view of industrial operations for adequate analysis and interpretation of general business trends, the report asserts. The committee finds that the Department of Commerce should encourage the gathering of statistics through its own efforts as are needed to give the public facts about the general trend of business.

The report states the proper functions of the Department of Commerce regarding business statistics to be as follows:

"1. To determine the character and extent of the information relating to important industries which is needed at frequent periodic intervals by the general public for analysis and interpretation of general business conditions.

"2. To undertake or continue to conduct comparatively exhaustive inquiries of the census type at annual or less frequent intervals.

"3. To foster and promote the collection by trade associations of frequent periodic information concerning particular industries; and to render advice and assistance in the formulation of methods and procedures for this work.

"4. To undertake the direct collection of reports from individual members of an industry only in the event that it prove impossible through such co-operative effort to bring about the compilation and release of adequate data

by a recognized trade association; and then only to the extent that such collection is warranted by general public interest in the results.

"5. To publish all statistical aggregates which are made available through the above procedures to the extent that their publication is of service to the general public and does not reveal industrial returns.

"6. On the basis of data thus secured and all other pertinent information, to conduct such economic analysis and interpretation as may be appropriate for the purpose of furthering a general interest in and understanding of current business statistics and their uses."

The report has been approved by the executive committee of the Business Advisory and Planning Council and will be considered by the general council at its next meeting on Thursday. The report was drafted after several months of investigation by and consultation with economists and statisticians in both the business and academic fields. Officials of the Bureau of Foreign and Domestic Commerce are developing a program to aid in effectuating the committee's proposals.

Co-operative effort by business men is urged by the committee, which points out the business community has a two-fold interest in statistical compilations, since it is the principal user of the data and supplies much of the basic information.

Regarding the collection of information, the committee states "it is believed that in the interests of economy and efficiency the ideal system would be one under which properly constituted trade associations performed the entire job of primary compilation for the two-fold purpose of assembling the comprehensive data needed by the membership of the industry and of preparing the limited statistical information which should be made public."

Mobile Paper Mill To Make White Paper

MOBILE, Ala., November 13, 1934.—The Mobile Paper Mill Company, Crichton, last week announced it would spend $25,000 for new construction work and machinery to provide for manufacture of white paper products from southern slash pine.

Announcement came through Mark Lyons, chairman of the new industries committee of the Mobile Chamber of Commerce, and it is regarded as an important step toward eventual manufacture of newsprint from southern pine. The Mobile mill is the first plant anywhere to use this type of pine for white paper manufacture. Heretofore only paper products of the kraft, or brown, type have been made from the timber.

A contract has been let to the Mobile Steel Company for erection of the building and machinery has been purchased. Much of the equipment must be especially built. Approximately 30 persons will be employed in the new operation, increasing the force employed by the company to 100 workers.

R. E. Hartman, president of the Mobile Paper Mill Company, has been engaged in the board, paper and bag manufacturing industry 25 years. Before coming to Mobile to take over the local plant, he had built and operated a large pulp and paper plant in Tuscaloosa. In addition to his reputation as a successful paper manufacturer, Mr. Hartman is well known in the industry.

TAPPI To Meet at Middletown

On interest to members and friends of the Technical Association of the Pulp and Paper Industry in the Middle West will be a dinner and meeting to be held at the Manchester Hotel in Middletown, Ohio, on Tuesday evening, November 20 at 6:30 P. M.

At this meeting preliminary plans for the organization of a TAPPI Section in Southern Ohio will be discussed. This section will probably include the large number of TAPPI members located in Middletown, Dayton, Hamilton, Chillicothe, Cincinnati, and other centers.

Secretary Macdonald will be present to assist the local committee in organizing a section. When organized this will be the sixth TAPPI local section organized since the local section plan was projected in 1929. Other Sections include the now well known Pacific, Lake States, Kalamazoo Valley, New England and Delaware Valley Sections. The sections are organized to enable TAPPI members to get together frequently and hold meetings without requiring any large number to travel a long distance to attend.

H. G. Specht, vice president of the Eastwood-Nealley Corporation, Belleville, N. J. will be the speaker of the evening and will give an interesting lecture on fourdrinier wire wear. Mr. Specht's company is probably one of the most progressive in the fourdrinier wire industry and is a member of the Technical Association.

Anyone interested is welcome to be present at either or both the dinner and the meeting. Those planning to attend the dinner should notify Vincent F. Waters, Wrenn Paper Company, Middletown, Ohio, so that proper arrangements may be made at the Manchester Hotel.

Process Engineers' Patent

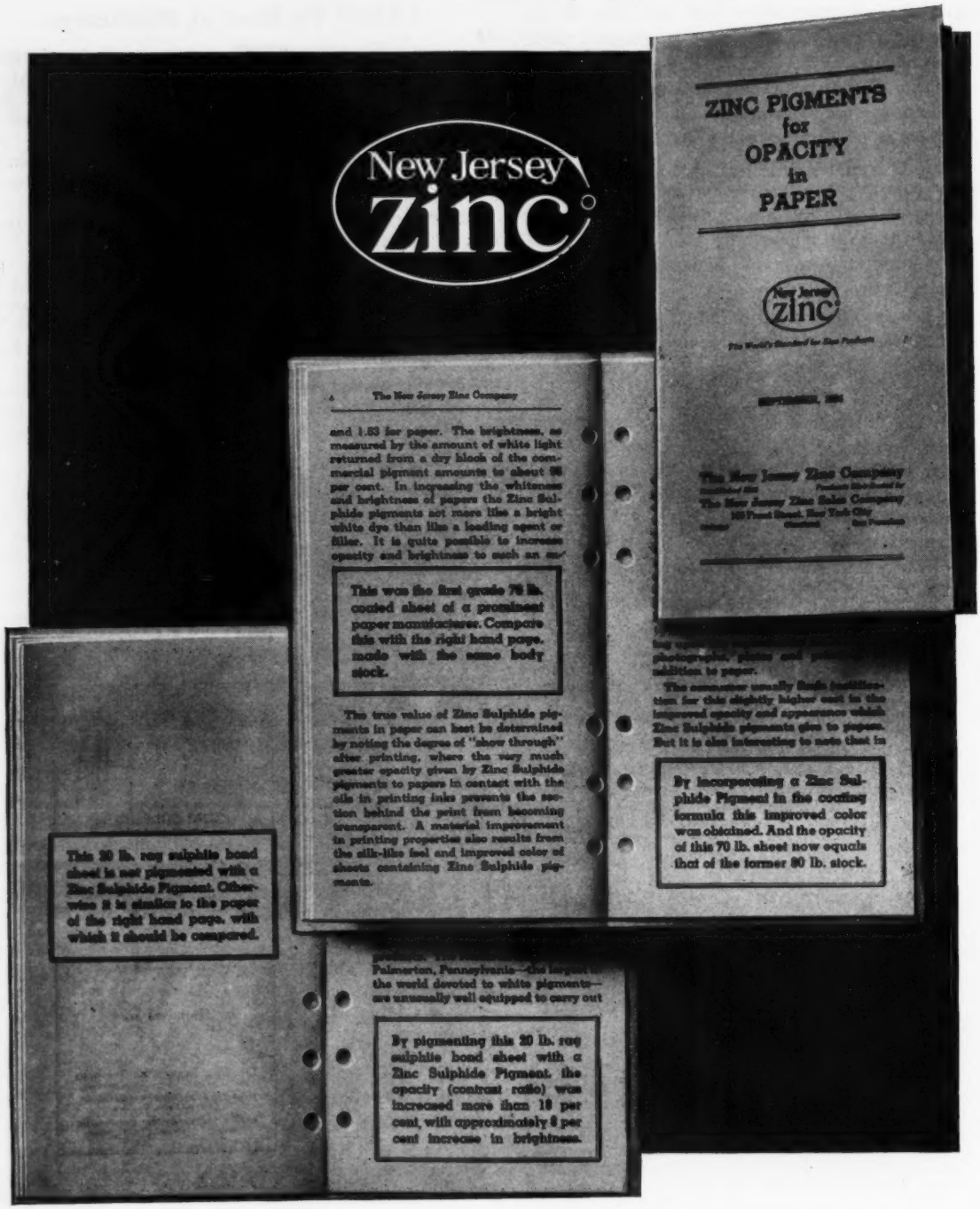
J. A. DeCew, president of Process Engineers, Inc., 9 West Prospect avenue, Mount Vernon, N. Y., writes: "In your issue of June 1, 1933, there was published a bulletin of the Patents Committee of the Technical Association in which it was stated that a certain patent No. 1,589,947, belonging to Process Engineers, Inc., had been held invalid in the District Court of the Northern District of Illinois.

"Your readers may have gained the impression from the synopsis of this decision, that the entire patent had been invalidated.

"We take this opportunity to inform your readers that the claims in suit that were held invalid in this litigation, have now been disclaimed and the patent remains with the followng claim: 'A method of sizing paper which consists in coagulating the size in the stock after said stock has passed through the Jordan.' This claim has the same presumption of validity as it had on its date of issue."

Paper Mill Wire Code Authority

The National Recovery Administration announces the following Code Authority membership for the pulp and paper mill wire cloth manufacturing industry: G. M. Peterson, Cheney Bigelow Wire Works, Springfield, Mass.; Paul O'Neill, Jos. O'Neill Wire Works, Inc., Port Chester, N. Y.; H. G. Specht, Eastwood-Nealley Corporation, Belleville, N. J.; Guy A. Disbro, the W. S. Tyler Company, Cleveland, Ohio; John D. Watson, Wisconsin Wire Works, Appleton, Wis.; Edward Docherty, Holyoke Wire Cloth Company, Holyoke, Mass.; and R. K. McCluskey, H. & T. McCluskey & Sons, Inc., New Haven, Conn.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This 20 lb. rag sulphite bond sheet is not pigmented with a Zinc Sulphide Pigment. Otherwise it is similar to the paper of the right hand page, with which it should be compared.
Palmerton, Pennsylvania—the largest in the world devoted to white pigments—are unusually well equipped to carry out
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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

Pulpwood Supply of the Pacific Northwest*

By Minot Davis[1]

In view of the increasing importance of the Pacific Northwest as a great pulp producing region, there is no question of greater importance than the supply of raw material, and the prospects of continued supply far into the future. When we speak of raw material we refer to standing hemlock, spruce, noble fir, and three species of white or silver fir. We do not at present consider cottonwood, nor do we consider Douglas fir.

We have heard in the past a number of prophecies of an impending timber famine in the United States. In 1880 the State of Maine was estimated to have about 6 billion feet of standing timber. At that time Senator Eugene Hale, a man of the highest standing, predicted that by 1920 there would be no timber left in Maine. As a matter of fact, since 1880 the State of Maine has cut over 40 billion feet of timber, and now has a remaining stand officially estimated at more than 30 billion feet.

About 30 years ago a prominent man who was supposed to be an authority on forestry predicted a timber famine within 30 years. These predictions were doubtless made in all sincerity; and even within the last ten years there have been official public warnings of an imminent shortage of timber. We are not at present concerned with the supply of timber for manufacture into lumber, which is believed to be ample. It is our purpose to discuss only the timber suitable for use as pulpwood.

Using figures for the years 1928 to 1932, it requires about 5 billion feet of pulpwood each year to supply all the pulp consumed in the United States, including ground wood, sulphite, sulphate and soda. Of this amount, about 1½ billion is imported, about 1 billion is produced in the Pacific Northwest, and about 2½ billion feet is produced elsewhere in the United States.

As to the amount of pulpwood available in the Pacific Northwest, we have some very recent and very carefully compiled information from the Pacific Northwest Forest Experiment Station in Portland, Oregon. This authority estimates the pulpwood supply as follows:

Oregon	48 billion feet
Washington	122 billion feet
Total	170 billion feet

This is enough to supply the present pulp production of Washington and Oregon for 170 years. But let us look a little further. In the 20 million acres of national forest land in Alaska there is estimated to be at least 70 billion feet of pulp timber, which is large enough to be classified as saw timber, and the equivalent of 70 billion feet more which would be produced in the form of cordwood, or a total of 140 billion feet of pulpwood in Alaska.

In other words, suppose that beginning tomorrow morning the United States imported no pulp and produced no pulp whatever except in the Pacific Northwest, there would be in Washington, Oregon and Alaska enough pulp timber now standing to supply the entire country for 62 years.

If we assume that the balance of the United States will continue to produce pulp about as at present, and that instead of importing pulp we depend upon the Pacific Northwest to supply all pulp now imported, as well as its own normal production, the pulp timber now standing here would last 125 years.

Sustained Yield

It is evident that we need not worry much about shortage of pulp timber in the immediate future. But what about the possibilities of a sustained yield of pulpwood, insuring a supply of raw material in perpetuity.

Hemlock has one great advantage over Douglas fir from a sustained yield viewpoint. While hemlock grows more slowly than fir, it can be fully utilized for pulp at any age from 50 to 80 years, while 80 year old Douglas fir has only a limited use for lumber.

Hemlock, under proper forest management, and making proper deductions from theoretical figures, may be expected to yield 20,000 board feet to the acre at age 60 years, and 40,000 feet to the acre at age 80 years. E. T. Allen, in his fine monograph on western hemlock considers 80 years the ideal cutting cycle, taking everything into account. For an 80 year cutting cycle, one half of the National Forest area in Alaska alone would furnish a perpetual supply of pulpwood for the entire present requirements of the United States. For a 60 year cutting cycle, three quarters of the area of the Alaska National Forests would be required.

Without passing on the merits of the question, whether or not the United States should import any pulp, it is clear that it is not necessary to import a single pound of pulp in order to protect our own supply. There can be not the slightest doubt that Oregon, Washington and Alaska can, if necessary, supply the entire United States with pulp.

Pulp manufacturers in the Pacific Northwest are giving

TAPPI SECTION, PAGE 241

* Presented at the fall meeting of the Technical Association of the Pulp and Paper Industry, Portland, Ore., Sept. 10 to 13, 1934.

[1]Manager, Logging and Timber Department, Weyerhaeuser Timber Company, Tacoma, Wash.

more and more attention each year to maintaining their own supply of pulpwood.

Trained foresters are being employed, and care is being taken that in country adapted to the reproduction of pulpwood, a sufficient number of trees of the proper species are left standing, so that a predominance of the desired species may be obtained. There is apparently room for considerable research along the lines of forest reproduction; that is, how to obtain the maximum crop of the particular varieties of timber that are specially desired. With the expert advice and continued co-operation of the United States Forest Service in this very important matter, and with an enlightened program of taxation for reforesting purposes, such as the States of Oregon and Washington are now developing, the great pulp industry of the Northwest may apparently look forward with confidence to an adequate supply of raw material for all time to come.

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Alkaline Processes

Paper Pulp. Seizuke Kodama. Japan. pat. 101,507 (June 14, 1933); C. A. 28:5239.—Bagasse, bamboo or wood is treated with bleaching powder solution in a ball mill.—C. J. W.

Paper Manufacture. John Traquair assignor to The Mead Research Engineering Co. U. S. pat. 1,961,405 (June 5, 1934).—Wood or grasses in a suitable state of subdivision is subjected to the action of an alkaline liquor, is mechanically disintegrated (preferably in a rod mill) in presence of the alkaline liquor, and, after filtering and washing, is refined (*e.g.*, in a jordan) and made into board.—A.P.-C.

The Rinman Alkaline Pulping Process. Sven A. Fahlgren. Paper Trade J. 98, No. 22:40-41 (May 31, 1934).—A brief description of Rinman's U. S. pat. 1,906,-102 of April 25, 1933, for alkalizing black liquor for converting it to a condition suitable for dry distillation.—A.P.-C.

Production of Pulp. Philippe J. Planquaert. Fr. pat. 756,553 (Dec. 12, 1933).—Cellulose is extracted by impregnating wood with caustic soda and then dry-heating it.—A.P.-C.

Production of Cellulose. Umberto Pomilio. Fr. pat. 756,626 (Dec. 13, 1933).—Vegetable material is treated in a continuous manner with a dilute solution of caustic soda and chlorine, the material being caused to descend by gravity in a tower and the reagents being introduced at an intermediate point of the tower and passing in counter-current to the material.—A. P-C.

Process for Cooking Pulp. J. W. A. Elling, Oslo. Swed. pat. 79,975 (Nov. 9, 1931).—Change in the process according to Swed. pat. 79,138 in which all digesters are filled with cellulose material.—J. F. O.

Sulphite Process

The Correct Composition of a Cooking Acid. E. A. Weber. Pulp Paper Can. 35,307 (May, 1934).—Weber considers that a cooking acid of 6 per cent total and 1.25 per cent combined sulphur dioxide is an ideal cooking acid.—A. P.-C.

Effect of Chip Length in Sulphite Pulping. J. N. McGovern and G. H. Chidester. Paper Trade J. 98, No. 18: 41-46 (May 3, 1934).—Sulphite digestions of western hemlock heartwood chips varying in length from ⅛ in. to 1⅛ in. indicated that there is no significant variation in the rate of pulping with variations in chip length, and that, except for the ⅛ in. and ¼ in. chips, the fiber length has no direct bearing on pulp strength.—A. P.-C.

Investigation of Various Physicochemical Factors Which Influence Sulphite Cooking. H. H. Saunderson and O. Maass. Can. J. Research 10: 24-35 (1934).—The penetration of aqueous sulphite solutions into differently shaped blocks of spruce wood was investigated and the effect of the shape, type of wood, and of the presence of imprisoned air determined. Measurements of the rates of diffusion of the constituents of sulphite acid into presoaked blocks of wood showed that free sulphur dioxide diffused more readily than calcium bisulphite. Adsorption of sulphur dioxide and calcium bisulphite solutions by spruce wood was measured at 30° and 50°C., and the influence of this factor on penetration was determined. The effect of penetration on delignification indicated the necessity of a satisfactory distribution of the lime salt at a low temperature to avoid localization of the lime during the pulping process. The relation of the findings to current practice in the sulphite mill is discussed.—A. P.-C.

Measurement of Sulphite Production by the Use of Stock Flow Meters and Chips Weightometer. R. K. Lear. Paper Trade J. 98, No. 26: 65-68 (June 28, 1934). —The system developed by International Paper Co., comprises adaptation of the Sparling main line water meter, specially designed automatic stock and chip samplers, and Merrick conveyor weightometer.—A. P.-C.

Control of Monosulphite Pulping of Straw Cellulose. K. Dolgov. Materialui Vsesoyuznuii Nauch.-Issledovatel. Inst. Bumazhnoi Tzellyuloznoi Prom. (Trans. All-Union Sci. Research Inst. Paper Cellulose Ind.) 1931, no. 4:78-96; C. A. 28:5233.—Practical methods for testing fresh and recovered spent sodium sulphite liquors.—C. J. W.

Chemistry of Sulphite Cooking. M. G. Eliashberg and M. F. Martuinov. Materialui Vsesoyuznuii Nauch.-Issledovatel. Inst. Bumazhnoi Tzellyuloznoi Prom. (Trans. All-Union Sci. Research Inst. Paper Cellulose Ind.) 1931, No. 4:5-43; C. A. 28:5233.—The results of the uncompleted laboratory experimental pulping led to the following observations: The existing relation of color changes and fluorescence (on exposure to ultra-violet rays) of alkaline liquors to the changes in their content of loosely bound sulphur dioxide is also characteristic of cellulose. The concentration of hydrogen ions in the liquor slightly decreases in the early part of cooking and then rapidly increases with the beginning of the formation of lignosulphonic acid. The solution of wood is imperceptible at

100-110°, increases rapidly at 120-130° and is somewhat retarded toward the end of cooking. The change of the curve of ash content progressives analogously to that of calcium oxide but somewhat higher, the two values rising in the first stage of cooking and then for some time running parallel to the axis of abscissas and finally declining again. The curve of the ash content of liquor constantly declines and runs considerably higher than that of calcium oxide. The curve of calcium oxide content in the liquor changes analogously to the corresponding curve of cellulose but in the reverse direction. The sulphur content of the undissolved residue changes in the process of cooking similarly to the calcium oxide content; viz., it increases at first, then for some time remains unchanged and finally decreases again, the maximum being one per cent sulphur of the absolutely dry wood. The lignin content in the undissolved residue is unchanged up to 130° and then is very rapidly decreased. In the course of cooking the sulphur content in the undissolved residue is continuously increased in relation to the lignin content. The cellulose content remains constant during almost the entire cooking. Sugars, observed in the liquor in the first stage of cooking, are formed exclusively from hemicelluloses. The solution of pentosans begins from the start, proceeding more energetically at 100-110° and becoming somewhat slower toward the end of cooking. At the final stage of cooking the hexosans go into solution much faster than the pentosans. The formation of reducing sugars in the liquor begins at 110-120°. The sugar formation in the liquor begins later and proceeds slower with a lower content of free sulphur dioxide. In the process of cooking the resin and fat contents of the undissolved residue are considerably reduced, in some cases the resin content being reduced by 60 per cent. Hägglund's theory of sulphite cooking is considered the most plausible but insufficient.—C. J. W.

Circulation in Sulphite Digesters. Otto Brune. Papier-Fabr. 32, No. 18: 206-08 (May 6, 1934).—The author first states that the circulation in a digester is dependent upon the shape of the digester, the method of filling with chips and most important the quantity of steam used. After explaining how a uniform circulation can be obtained by the correct usage of the steam, the author comes to the conclusion that a satisfactory pulp can be produced without forced circulation if the above factors are adhered to.—J. F. O.

Process and Arrangement for the Continuous Preparation of Calcium Bisulphate with the Use of an Absorption Space Filled with Stone. Werner Scholz, Oberleschen. Ger. pat. 588,966 (May 29, 1932).—The interior of the absorption space is kept under pressure and a mixture of finely divided calcium carbonate with water and compressed sulphur dioxide gas are introduced in a counter current direction. The stone used to fill the absorption space is neutral.—J. F. O.

Process for the Manufacture of Sulphite Pulp. C. F. Kullgren, Stockholm. Swed. pat. 80,219 (Jan. 28, 1932).—Method for removal of lignin sulphonic acid.—J. F. O.

Sulphite Waste Liquors

Sulphite Waste Liquor As a Cement for Linoleum. L. Thiele. Kunststoffe 24, No. 6:151-152 (June, 1934).—Cement made from sulphite waste liquor for glueing linoleum to the floor in the form in which it is usually marketed is entirely unsuitable for this purpose and on account of its hygroscopic properties causes a quick decay of the jute.—C. J. W.

Utilization of Sulphite Waste Liquor. Guy C. Howard. Ind. Eng. Chem. 26: 614-617 (June, 1934).—A brief outline of work carried out in recent years at the Marathon Paper Mills Co., Rothschild, Wis., on the Howard system of treating sulphite waste liquor, comprising: (1) a main process designed to reduce stream pollution and recover products which can be used in making fresh acid and as boiler fuel, and (2) supplemental process for making special products.—A. P.-C.

Manufacture of Absolute Alcohol from Sulphite Waste Liquor Mash in a Continuous Process According to the Drawinol Process. K. R. Dietrich, Papier-Fabr. 32, No. 7: 73-76 (Feb. 18, 1934).—By means of several drawings and illustrations the author describes the continuous manufacture of absolute alcohol by the Drawinol process. This process consists essentially of three columns with auxiliary apparatus. The process has the advantages of being more economical in heat and there is far less danger of explosions. Molasses, potatoes, beets and other mashes can be used as the raw material in place of the sulphite liquor.—J. F. O.

Beating

Beating or Jordaning—Which? R. D. Kehoe. Paper Trade J. 99, No. 2: 18-22 (July 12, 1934).—A discussion showing that proper treatment of pulps with minimum power consumption comprises: (1) complete defiberization before beating, (2) beating at high consistency to best results obtainable from the stock and to the required freeness or slowness, (3) jordaning with narrow bars and at low consistency without appreciable slowing of the stock further than the point attained by the beaters.—A. P.-C.

Pulp Refiner. William H. Cannard. U. S. pat 1,963,970, (June 26, 1934).—A series of milling rolls or rods are seated in suitable grinding grooves or channels in the periphery of a plug similar to a jordan plug. The rolls are unconnected with the plug so as to float and move outwardly from their seats under centrifugal force to exert a varying pressure according to the speed of the plug. The rolls are plain or fluted according as a crushing or a cutting action is desired.—A. P.-C.

Beater or Refiner. Emil Schneebeli. Fr. pat. 760,083 (Aug. 25, 1933).—The stock is contained in a hemispherical vat or trough. The refining element consists of a stationary circular crown of rectangular cross section mounted centrally above the surface of the stock over which is freely suspended a co-acting rotating crown. Each of the crowns is provided with three concentric sets of inter-meshing wedge-shaped teeth. The stock is fed to the rings by means of a spiral mounted inside a vertical tube on the same shaft as the rotating crown and extending nearly to the bottom of the trough.—A. P.-C.

Pulp Refiner. Hubert G. Welsford and Andrew N. Russell assignors to Dominion Engineering Works, Ltd. U. S. pat. 1,961,808 (June 5, 1934).—The invention provides improvements to the Wiener refiner (U. S. pat. 1,730,908, Oct. 8, 1929) designed to increase its effectiveness in the treatment of knots and tailings and prevent clogging of the machine. This is obtained by providing a special breaking or reducing zone comprising a breaking chamber formed by a cylindrical wall extension of the refiner shell and one or more hammer members which are rigidly or pivotally connected to the plug shaft. The inner wall of the chamber is corrugated to provide spirally extending V-shaped ridges and valleys.—A. P.-C.

Beater Roll Setting and Adjustment. Melvin A. Mills assignor to Elizabeth M. O'Neil. U. S. pat. 1,962,402 (June 12, 1934).—The roll is mounted for vertical movements, which is produced by means of semi-circularly-shaped vertically inclined wedge or cam formations on which rest the roll-shaft bearings. Two such sets of cams

are provided, one to effect a quick lift or permit a quick lowering of the roll to secure a rough initial adjustment, and the other to control fine adjustment of the roll. Means are provided for automatically operating the fine adjustment at a predetermined rate and for stopping the lowering of the roll at a given position.—A. P.-C.

Beater Roll. Herbert T. Randall assignor to The Champion Coated Paper Co., U. S. pat. 1,964,690 (June 26, 1934).—The roll is built up of a series of discoid spiders mounted on a shaft; detachable curved flanges are mounted on the spiders and the beater bars are welded to the flanges, no fillers being used between the bars.—A. P.-C.

Shell Lining for Jordan Engines. Frank M. Gloyd assignor to Simonds, Worden, White Co. U. S. pat. 1,963,787 (June 19, 1934).—The shell is built up of a series of broad, relatively thin, corrugated metal bars, assembled side by side in a circular series. Alternate bars are corrugated reversely so as to bring convex zones into contact and form longitudinal rows of rhomboidal cells. The contacting convexities are welded together, preferably at their outer edges; and the cells are filled with wood or (preferably) with an abrasive composition, *e.g.*, aluminous oxide bonded with a synthetic resin such as redmanol.—A. P.-C.

Bleaching

Chemistry of Pulp Bleaching. S. A. Fotiev. Bumazhnaya Prom. 13, no. 3:22-27 (1934); C. A. 28:5234.—The chemistry of simple bleaching was studied by treating 100 grams of soft cellulose with 2 liters of calcium hypochlorite solution (5 per cent. concentration) at 30 deg. for 1, 3, 5 and 6 hours washing and drying. The whiteness of the cellulose increased from 56 (Ostwald) to 68 in the first hour of bleaching and to 78 in the next 5 hours. The lignin content dropped in the first hour from 1.5 to 1 per cent and then gradually to 0.7 per cent. The hardness changed from 38 to 10 in the first hour and then slowly to 3 at the end. The content of alpha-cellulose was reduced slowly at the beginning and then more rapidly toward the end from 88.5 to 85.6 per cent. The copper number rose slowly in the first 3 hours from 1.6 to 1.7 and then sharply to 2.6. The viscosity decreased from 25 to 17 in the first 3 hours and then to 10 at the end. The changes of the constants of alpha-cellulose and copper number are caused chiefly by the acid hydrolysis with the gradually increasing concentration of hydrochloric acid toward the end of bleaching. The chlorination and oxidation, the reactions predominating in the beginning of bleaching, have little effect on the alpha-cellulose content and copper number but are the cause of the changes in lignin content and whiteness. The tensile strength of the pulp at first increased then remained constant for a period of time and finally sharply dropped. The explanation is that hard unbleached cellulose gradually freed from lignin becomes more flexible and strong but is weakened at the advanced stages of bleaching by the predominating acid hydrolysis.—C. J. W.

Bleaching of Rag Halfstuff. S. A. Fotiev and S. Bogdanov. Materialui Vsesoyuznuii Nauch.-Issledovatel. Inst. Bumazhnoi Tzellyuloznoi Prom. (Trans. All-Union Sci. Research Inst. Paper Cellulose Ind.) 1931, No. 4:50-56; C. A. 28:5235.—A rapid bleaching (3 hours) with the addition of a mineral acid produced a weaker halfstuff with a considerably higher consumption of calcium hypochlorite than a slow bleaching without the aid of an acid. The bleaching with sodium hypochlorite as compared with the calcium salt gave a halfstuff of the same quality with a lower consumption of chlorine. The stage bleaching by the ordinary method and by the De Vain method produced considerably stronger halfstuff with a lower consumption of chlorine than by the slow method.—C. J. W.

Comparative Experiments on Bleaching Cotton Cellulose with Solutions of Calcium and Sodium Hypochlorites. D. Halperin, D. Tumarkin and B. Kozlovskii. J. Applied Chem. (U. S. S. R.) 6:536-545 (1933); C. A. 28:4221.—Calcium hypochlorite solutions are distinguished from those of sodium hypochlorite having the same original content of active chlorine by a higher "activity," i.e., higher bleaching and oxidizing powers, the difference being particularly noticeable when sodium hypochlorite solutions are used with an excess of alkali. The consumption of the active chlorine is in the following decreasing order: calcium hypochlorite solution, "neutral" solution of sodium hypochlorite and "alkaline" solution of the sodium salt. The difference in the bleaching power of the solutions is particularly noticeable for low concentrations, disappearing for the high ones. The destructive power of the solutions in bleaching is evident only for severe conditions such as a temperature of 30 deg. Since the effect of all the solutions is the same, preference should be given to the most economical.—C. J. W.

Process for Rendering Soda and Sulphate Pulps Easy Bleaching. Gotthard Rosen. Fr. pat. 43,006; addn. to 742,062.—The original patent provides for treating pulp, before bleaching by known processes, by successfully washing with very dilute alkali solution, a hot solution of an alkaline-earth base and chlorine water or soluble hypochlorite, and finally with an acid. The present invention provides that the acid used shall form soluble salts with the alkaline-earth base.—A. P.-C.

Continuous Bleaching Process and Apparatus Therefor. International Paper Co. Fr. pat. 751,230.—The pulp is treated at a high consistency so that it travels through the apparatus practically as a solid mass. The portion of the chamber near the stock inlet is placed under vacuum to remove the air from the pulp, and chlorine gas, preferably under pressure, is introduced at a further point in the chamber. Bleaching may be effected in several stages in a number of units arranged in series, with intermediate washing and concentration of the stock.—A. P.-C.

The Art of Bleaching in Theory and Practice. C. T. Henderson. Paper Trade J. 98, No. 26: 59-62 (June 28, 1934).—A discussion of pretreatment of pulp with chlorine, showing the distinction between chlorine as such and chlorine as hypochlorous acid as reagents for the treatment of pulp.—A. P.-C.

Bleach Liquor and the Bleaching of Pulp. Eberh. Munds. Wochbl Papierfabr. 65, No. 13: 223-225 (March 31, 1934).—The author discusses certain statements made in a previous article of the same name by Ecke with which he is not in accordance. Among the facts disputed are; the maximum strength of the bleach liquor for best results, injury done to the fibers when bleach beaters are slowly filled, maximum temperature and time of bleaching, the content of free lime in the bleach liquor. The author also believes that the tendency is toward the bleaching in the first stage especially with chlorine water instead of hypochlorite.—J. F. O.

Bleaching with Chlorine Gas. Eberhardt Munds. Wochbl Papierfabr. 65, No. 27: 480 (July 7, 1934). A short history of the use of chlorine gas for bleaching, the first mention as such being in 1830.—J. F. O.

Chemical Control in Paper Manufacture*

By J. E. Minor[1]

Chemistry has been rightly called the handmaid of all sciences. The chemistry underlying the process of papermaking has been unfolding as rapidly as the accurate science of papermaking and along with it have come chemical tests for standardizing both the process and the product of this industrial science. Today such tests are being advocated by some and refuted by others. The number of complicating conditions and the irregularities of raw materials make it impossible to avoid getting, at times, test results which seem to be at wide variance with the results of practical experience. In this discussion technique or scientific accuracy of method will not be considered but rather attention will be centered on the interpretation of results as an aid to the control of quality in papermaking. Such a discussion should result in giving to at least some of us a clearer conception as to where our chemical tests are of value, where they might be further applied and the reasons for some of the apparent discrepancies which are so disconcerting.

The properties of paper which are of interest to the science of papermaking are related to strength, durability and permanence, such properties as appearance, feel, printability, etc. being still in the realm of art for which chemical tests have very little significance. Strength, durability and permanence are ultimately measured by physical tests but it is through chemical tests that the manufacturer may hope to get such process control as will enable him to uniformly obtain the desired physical properties and that the large paper buyers may hope to get information as to the conditions of manufacture which may influence the durability and permanence of his papers.

Action in the Beater

It is said that paper is made in the beater and all control of the previous cooking and bleaching operation should be with reference to the effect on the beating operation and on the quality of the finished paper. Therefore, I should like here to briefly review what seems to be the most plausible explanation of what does occur in the beater so that we may be in a better shape to consider how to prepare fibers for the best beater results.

The potential paper strength developed during beating may be considered as related to

1. The development of a swollen, colloidal surface on the fibers which when dried has adhesive properties.
2. The development and entanglement of fine fibrils. This entanglement cannot be a controlling factor since wet fibers are so easily pulled apart.
3. The strength of fiber and fibril which resists degradation by the action of the beater but is no greater after beating than before.

Latest scientific evidence places on a firm foundation the theory of the development by beating of an adhesive, colloidal gum on the surface of the fibers which binds fibers and fibrils. The capacity for strong bonding between particles varies with the type of fiber and this is probably the predominating factor measured by the tensile and bursting tests.

The relation of this colloidal gum to fiber quality may be very nicely explained by analogy with rayon manufacture. If a rayon thread is spun without tension leaving the micelles in a random arrangement as in a colloidal gum, the thread has very little strength. If such a thread is stretched under a tension as in growth of vegetable fibers, the tensile strength of the thread may be increased by as much as 400 per cent. But in attaining such strength the elasticity has decreased to about 20 per cent of the original. By analogy, the ideal papermaking fiber or fibril must have a compact well stretched core for strength surrounded by a colloidal swelling layer of random arrangement which permit of greater flexibility and more contact points with other fiber particles. The loosening of this outer layer to just the right depth is the work of the beater. Besides the swelling of this layer, there is always a certain per cent of chemical degradation from the slight acidity of the beater which tends to strengthen the cementing power of the swollen surfaces. Too much of this sealing cement gives a stiffness which develops at the expense of tearing resistance.

The value of the entanglement of fine fibrils lies in the increased number of fine points of contact giving increased tearing resistance and such elasticity as allows bending without breaking. This is emphasized by the sensitivity of tear to shortening of fibrils in long beating. Tear decreases with beating after the loss of fiber strength and the weakening of entanglement by shortening of fibrils has overbalanced the increased number of points of contact and the increased flexibility of softened fibers.

Fiber Properties

Fiber strength and the maintenance of strength after beating is an inherent property of structure of fiber and of the presence of accelerating or inhibiting impurities. The difference between alpha wood pulp and the lower grades is in the better removal of inherent impurities which in beating tend to destroy fiber structure before flexibility is attained while the long hard beating which good rag fibers endure is probably aided by the remnants of waxy bodies enclosing the fibrils. Folding endurance is mostly a measure of fiber and fibril strength aided by protective coatings which decrease the tension and soften the sharpness of the fold by cushioning. This cushioning effect is well illustrated when double strips of thin papers are folded in the folding machine which give 10 to 15 times the number of folds of the single strips.

Therefore, in the making of strong, durable paper, the need is to control the process so as to get from the fibers used the maximum of swelling or hydration of surface to give strong tensile and Mullen, the maximum number of fine strong fibrils for entanglement and good tear while the fibrils must be so developed as to maintain a core of well stretched dense material which gives folding strength to the sheet.

The relation between strong fibers and strong paper is often difficult to make fit into practical experience. Mill managers say they can see no value in chemical tests for fiber strength because they cannot relate the results to paper strength. It is said in the bible that "Faith is the substance of things hoped for, the evidence of things unseen," and even the most optimistic advocate of chemical testing will have to answer some such individual questions by faith in the principal of a relation built on science, on

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the increasingly wide acceptance by practical men and scientists and by the increasing supply of practical evidence.

When everything else is equal, there is no doubt that the strength of paper is directly related to the strength of fibers, but adjusting the beater operation to meet the requirements of the particular fibers in question is too little understood to avoid large variables in that direction. Suppose the fiber stock has strong fibers and the beater roll is handled to cut and crush the stock without good hydration or fibrillation or impurities are present to weaken fibril cores and destroy sizing effects. Even then the stronger the fiber the better it withstands all this. We need a better development of the microscopy of papermaking fibers to enable us to follow the beating operation more intelligently, and with that we would see more clearly the value of fiber strength for paper strength and permanence. We must push towards the standardization of every variable in the beater if we want to master the science of making uniformly satisfactory paper and a very important variable is fiber strength.

Cuprammonium Viscosity

For testing fiber strength, the most advocated test is that of the viscosity of a cuprammonium solution. Let me try to explain the science of this test. We know that the atoms composing fiber cellulose are bound by a primary force into chain structures which are as strong as the best of steel and as hard as a diamond, and that these chains are in turn bound by a second or less rigid force into longer chains and bundles which constitute the fiber structure. Mechanical beating by its tensile pull and lateral cleavage separates the fibers into fibrils breaking only the secondary forces. Also, when the fibers are stirred in this cuprammonium solution, these secondary bindings are loosed only more completely than in the beater, leaving the primary chains to move independently in the solution. At definitely spaced positions on their surfaces, these chains may bind molecules of water with such force as to considerably compress the volume. The water molecules just surrounding these tightly bound ones are held with a force slightly less than the first ones and with successive layers the force decreases until the outer layer is held with a force slightly more than that of the water as a whole. A free moving chain or bundle of chains would carry this compressed water through the solution and the shape of the mass would be something like a sphere whose diameter is the length of the chain or bundle. The rate at which such a solution passes through a very small tube gives us the viscosity as a direct measure of the average length of the chain molecules in the solution.

One mill executive in talking about viscosity testing accepted the evidence that he was injuring his fiber strength by processing as he did but said he offset the loss by buying a high grade rag which would stand such treatment and still give him the paper that his customer desired. Perhaps he did not really mean it, but depression has helped a lot of us to see things differently. No mill can today expect to maintain its trade without exerting every effort to get the most possible quality from the material put into a paper. If you pay for strong rags, why not keep the maximum portion of that strength for the finished paper. Faulty processing will do more than weaken fiber strength. It is quite apt to leave deteriorating impurities which continue to function in the finished paper and shorten the life span. There is no one thing that will arouse the suspicion of a keen paper buyer as evidence of carelessness in manufacture.

The best of unbleached rag fibers as purchased have viscosities of 500 to 1000, textile bleached new clippings 100 to 600, and alpha wood pulp 40 to 70. What happens to these viscosities in papermill processing is shown in data of tests from four different mills.

	Unbleached Muslins		Blue Overalls	
	Mill I	Mill II	Mill III	Mill IV
Rags as purchased	670	566	370	238
Mill cooked, washed	147	117	123	237
Bleached from drainer	141	49	10	25
Finished Paper	55	29	4	15

In a fifth mill two samples of rags from different parts of the same drainer gave viscosities of 46.8 and 21.3 indictating the need of better drainer control.

In mills I and II the boiling operation seemed too severe and probably indicates that the same paper could have been made from cheaper rags more carefully processed. Mill I added alum to the beater when furnishing which probably accounts for the large drop in viscosity from beating that paper. In mills II, III, and IV the bleaching was too severe and reduced good new stock to the level of worn stock which could have been purchased at less price. In theory there should be no appreciable loss of viscosity from beater to finished paper and the losses shown are undoubtedly due to impurities present which will also tend to shorten the life span of the papers.

Conservation of Fiber Strength

I should hesitate to try to state what combination of conditions will best conserve fiber strength in the cooking operation but in general I should say that—

1. Air pockets in the boiler furnish, too much alkali or too much pressure are all conducive to loss of strength.
2. Some emulsifying agent with the caustic is better for the stock than straight caustic or lime.
3. A double cook has advantages for conserving fiber strength. Stripping fast dyes takes considerable time and considerable alkali making it necessary when using caustic to start with a dangerously strong alkali or to blow off and recharge with alkali. Usually less total alkali is required for the double blow off.

The older method of determining the alkali requirement is to titrate the alkalinity of the blow off liquor for the alkali remaining free and to titrate the ash of this liquor for the concentration of total alkali. The difference between these two figures gives the alkali consumed. The difficulty in interpretation lies in the getting of a representative sample of the liquor and in the amount of alkali that adheres to the rags.

The danger to strength, when cooked rags are not washed for some time after cooking is shown in data from laboratory washing of mill cooked rags:

	Prints (Viscosity)	Canvas (Viscosity)
Raw rags	98	139
Cooked, washed at once	99	109
Dried, washed 2 wks. later	91	93
Kept moist 2 weeks	60	59

For the cooking of rags to the best conservation of stock quality, there is no better method of standardizing conditions than by the viscosity test. Its labor and expense is fully repaid by the saving of quality rags. Ideal cooking should result when such viscosity tests are intelligently balanced with practical judgment as to necessities for proper cleansing.

The viscosity test should also find a use in the purchase of rags and it would help to dispel some of the superstitions which now mar the good judgment of some of the best buyers.

It is probable that there are few paper buyers who are prepared to interpret viscosity tests to any especial advantage for the buying of paper. As most papers are sold

on physical tests, it is not a matter of concern to the buyer whether the strength was obtained from strong fibers or from skill in processing. If a buyer were offered a paper as made of unbleached muslin and he found a viscosity around 10, he would have evidence on which to discount the quality of the manufacturer and the expected permanence. But few buyers know the quality of rags used and, therefore, they are not prepared to interpret viscosity tests to any advantage.

Alpha Cellulose and Copper Number

The alpha test is of little control value for rag mills since it does not register sufficient change for degradation in process. The test measures the quantity of strong papermaking material in stock but does not distinguish the wide difference in the quality of this alpha portion which has a large effect on papermaking quality.

For a finished paper a low alpha content for the type of fiber is apt to mean a weakened paper fiber but not necessarily an impermanent one. In general a high loss of alpha content after artificial aging is suspicious for permanence of strength but a high retention is very slight evidence in favor of permanence. We have had sulphite papers which retained 95 per cent of their alpha content after aging and yet under the same conditions retained less than 5 per cent of the folding strength. Possibly in that case the degradation products were so held back as to give a false alpha number but the test was performed with usual precautions.

Copper number, to my mind, can very efficiently supplement or replace the viscosity test for the bleaching of rag stock. Both tests are quite sensitive to bleach degradation. Since the alkali cook in the boiler will remove practically all of the copper number material, washed rags of any kind should not show a copper number of more than about 0.5. Any larger copper number found in drainer stock is indicative of excess bleaching or of bleaching under acid conditions without washing before draining so that the rags have become degraded by the acid residues of the drainer liquor. For such acid bleaching the degradation is said to be doubled for each time that the time of contact is doubled, two weeks in the drainer giving twice the loss of one week.

A high copper number in a fiinished rag paper is very suspicious of impurities but it is not condemnatory unless there is some supporting evidence to indicate that the copper number is from degraded stock. There are a few additions used in special papers which are apt to give a high copper number but are not related to paper degradation such as zinc sulphide pigment.

For wood papers except for the high grade alpha papers the copper number is always high due to residual woody impurities making it difficult to interpret such tests.

Any marked increase of copper number after aging is very indicative of active impurities which will shorten the expected life span of the paper, causing yellowing and brittleness. Light aging causes a much greater increase than does oven aging but the increase for light aging after oven aging is no greater than for light aging alone, though of course the double treatment has caused a far greater loss of strength than the single treatment. This is because the copper number test measures the mass of an intermediate product in the course of fiber degradation and the rate of destruction has not been altered by the previous treatment.

For the technical man in a small mill who has not time to make many accurate copper number tests, I would recommend following the drainer stock with a qualitative test to which any careful helper can be trained. A small sample is merely cooked in the solution for five minutes and washed on a screen and the amount of reddish color noted. A good stock should show not more than a faint trace of pink.

Another test which can be well utilized by practical men both for rag purchasing and for drainer stock is the soda soluble test. I know a few mills that have revamped their whole stock processing on this test alone. An ordinary household pressure cooker will hold a half dozen beaker charges at a time and if the rags are covered with the alkaline liquor, the danger of air pockets can be eliminated. The size of sample used must vary with the accuracy of the balance available. If you have not followed it and want a surprise, cook a sample of rags from a drainer after several weeks at a pH of 4.0 or near that. Most of shrinkage shown by such a test indicates similar loss in white water over the machine and can reach 15 per cent which must be added to boiler shrinkage.

Acidity

Among the earlier of the chemical tests to get a hold on the industry is that for acidity. The titration method results could never be closely tied up with practical experience but the advent of color indicators and of equipment by which practical men could follow the active acidity, even under the high sounding name of pH, marked a big gain for the science of papermaking and for the quality of paper.

Today, all papers made for quality or for any considerable life span are made to definite pH specifications which should be controlled throughout the process.

The points of interest in connection with pH testing could be summarized as follows:

1. While a pH of 7.0 is neutral for water, the neutral point for the cellulose of fibers is near 6.0 while 7.0 is decidedly alkaline and water engineers are wrong in urging a pH of 7.0 as neutral for papermaking.
2. It is quite well established that soaking rags or pulp for any considerable time in either bleach or alum at a pH above 5.0 does very little damage, but that the evidence of damage increases rapidly as the pH is lowered from 5.0 to 4.0. Today a pH of 5.0 for the water extract of paper has been rather widely accepted as a safe lower margin for papermaking. It is my belief that the lower limit of 5.0 should be applied all through the process.
3. Rags which have been cooked in alkali can be washed much cleaner of alkali and iron in water of 5.0 than 7.0 and if we are correct in accepting 5.0 as safe for finished paper, no damage to fibers should occur from washing at a pH of 5.0.
4. In bleaching the margin of safety between the desired color and an unnecessary loss of fiber strength is quite narrow. Bleaching in an acid bleach, as in adding alum is the most effective in removing color and it is reasonably safe if properly controlled. Acid bleach will work first on the more sensitive colors and if it is washed out or neutralized as soon as the color is gone there need not be any damage to fibers. Neutral bleaching is said to be even more dangerous than acid bleaching with a less sharp end point.

Wood pulp should not be bleached in an acid medium for, unlike rags, the impurities are within the sensitive interiors of the fibers and bleach to be effective must penetrate the fibers leaving a danger of acid residues being fixed within the fibers. For this reason alkaline bleaching of wood pulp has quite come into favor.

5. From following the pH in the drainers, I am convinced that whenever that pH is below 5.0 and the rags remain in the drainer for any length of time, fiber strength is much injured.

6. When beating is done in hard water, the pH relations are more complicated than with soft waters and no processing liquid is apt to give any indication of the pH of the water extract of the finished paper. It is quite possible with hard water to have the tray water 7.0 or more and the finished paper down to 4.5.

7. It is the distribution of acidity within the fibers rather than the total amount present which regulates the effect of that acidity on the finished paper.

An example of the difficulty encountered in neutralizing acidity which has had a chance to penetrate the fibers is shown in data of a very normal case of overall stock which from the drainer showed a pH of 4.3 indicating the use of considerable alum to brighten the bleaching operation. This stock was furnished to mill water which had a pH of 6.9 and beaten for six hours when the pH was 4.9, but six hours more beating lowered the pH of the liquid to 4.6. The poor penetration of the alkaline size and dilution waters is shown by the fact that while the pH at the head box was 6.0, the water extract of the finished paper was 4.3.

8. It is quite possible to raise the pH of a beater of acid stock by adding soda ash, and it is undoubtedly better to do so than to beat the life out of the fibers in the acid medium. It is also quite possible to raise the pH of a finished paper by tub sizing in an alkaline size, and that is undoubtedly better for the sales program than chancing a rejection of the order. There are no doubt conditions in which fibers otherwise well processed may become entirely neutralized by such subsequent alkalinity, and in which strong rag fibers show sufficient reserve strength to give a good oven test in spite of acid residues, but on such evidence as that just cited and on scientific reasoning, I base my firm conviction that the only safe way to make real permanent paper with the maximum of strength and durability is to never allow the stock to contact acid beyond that permitted long enough for good penetration.

The value of making paper to a definite pH is of unquestionable value in the general quality protection, but the pH of finished paper should not be considered as an infallible criterion of quality for excess alum added at the chest or head box may lower a pH test beyond its power to injure permanence while the acidity of the fibers in the earlier part of the process may be so masked by later alkaline treatment that the higher pH value will mask the potential weaknesses of the acid residues.

The test for total acidity is more specialized in its relation to quality than is the pH test. As now used it is a very good measure of the amount of degraded fibers present but it does not separate the harmful alum aridity from the harmless fiber acidity. Better results would be expected if the end point were near 5.0 pH instead of the usual 8.3. But at pH 5.0 very few papers have any acidity at all. But even a perfect test for total acidity would still leave us the problem of interpretation as it gives no idea of the distribution of acid in the fiber which seems to be the important factor for permanence of strength.

Newly made papers may show very little or no difference in acidity whether they are run off quickly after adding the alum or whether the stock has had an excess of alum and remained in the chest over the week end, but when such papers are aged, especially with light aging, the fibers which had the long soak and increased penetration will show a decidedly less permanence than those with the shorter time of contact. And the habit of adding more alum on Monday morning to restore the lost sizing effect is only adding a little more fuel to the fire of impermanence.

A fairly good check on the presence of penetrated acidity is a comparison of pH or total acidity figures for samples of paper taken from each end of the dryers. Any increase of acidity due to drier action is fairly good indication of penetrated acidity, possibly aided by too high dryer temperature.

We have been discussing the chemistry of rosin sizing for years but we are still asking why sizing holds for one run of paper and not for another, why sometimes decreasing the amount of rosin added gives a higher rosin content in the paper and some mills have still to learn that dumping more rosin size in the chest is apt to make matters worse.

Sizing

For sizing difficulties in a mill, the best tackle is a study of the size and water used in relation to the alum. When dilute alum is added to rosin size drop by drop there is seen a gradually increasing opacity and then the slow separation of curds which on settling leave first a milk then a clear water. Alum added to alkali without the rosin will go through the same changes, but considerably more alum is needed for flocking than when the rosin is present, and when impure mill water is used containing lime, iron, etc., the alum curdles even more easily than for rosin alone. Good sizing can only be attained by conditions which favor the slowest possible formation of flocks but a final complete separation of flocks and liquid.

When too much alum is used, the rosin is well set on to the fibers but the rapid flocking causes it to set in large curds with less distribution and less waterproofing power. Also in this case much of the adherence is accomplished by the aluminum ions instead of by the harmless alumina flocks thus creating an acid condition on the fiber surface harmful to the life of the paper.

Impurities in the beater will also cause the aggregates to increase in size giving poor sizing for the amount of rosin retained. The remedy is pure water, though the situation is much improved by adding an emulsifying agent like starch or glue. The newer solutions with the finer distribution of the particles in the rosin size for the purpose of getting a better spreading of the size on the fibers is undoubtedly a step in the right direction. But the effect of much valuable equipment for such a purpose is often lost by small amounts of impurities in the beater waters which immediately curdle the size before it can be absorbed by the fibers. Coagulating impurities and heat are the two prominent agents for destroying rosin size while starch and glue tend to neutralize such effects.

As to the desirable temperature of dryers for setting rosin size, I know of no better evidence than that of Oeman who advises a gradual rise of temperature for the paper to 160° F. while it still contains 50 per cent of its weight in water. At that temperature rosin begins to melt slightly and enough moisture is needed to allow the free movement for the spreading of the rosin. After the spreading, the remaining moisture must be quickly evaporated or the good effect of distribution will be again lost.

Conclusion

In conclusion I should like to urge attention to the principles underlying the chemical testing in mill control in order that the tests may be applied and interpreted correctly. They are your servants to do your bidding and even though they may not do all that you desire of them I feel sure that you will find their constant service of inestimable value in the standardization of your mill process and product.

Refining of Paper Stock*

By C. R. Crawford[1]

The refining of various stocks used in the manufacture of paper is so broad in its scope, when we consider tissue, bond, or the many other grades that I will limit my discussion to boxboard.

It is true that some manufacturers of paper look upon the manufacture of board as a very rough process, but considering that nearly every sheet of board has in addition to old paper stock, one or perhaps two liners of new stock that have to be refined to the proper degree to not only combine with the other parts of the sheet, but also to give the sheet certain characteristics that are demanded by the box maker, I believe this makes the manufacture of board even more complicated than most other grades, and in reality takes in the whole range of new papers.

While the fourdrinier mills have only one kind of stock at a time to refine properly and bring to the machine, the board maker always has two and sometimes four kinds, a filler and one liner, and at other times a filler, a back liner, a top liner, and an under liner, and where nearly always one or two are new stocks.

If we take first the filler part of a board sheet, which in the majority of cases is composed of old paper stocks, there is one factor that board men have recognized in the last few years that has enabled them to speed up their machines and yet produce a better sheet of board, and that is to utilize the pre-work done on the stock as all mixed paper stock has had some degree of refinement before it enters the mixed paper field. As a consequence, all the filler part of any board sheet really needs a rough selection of the bale and the thorough pulping or defibering, then a quick passage to the paper machine.

Dirt Removal

At the time of the pulping and defibering process, we should do so by bringing two metal surfaces in close contact only, as we do not want to drive the dirt into the pulp and therefore effect a ready separation; that is, we can remove the dirt after the paper stock is pulped, provided we have not ground up the dirt in pulping the stock.

All the filler part of a board sheet has been already refined to varying degrees such as is required for the various grades from tissue to glassine, and therefore all we can hope to do to a stock of this kind is first to thoroughly clean it and then pulp it so that each fiber is separated.

If makers of board will first clean their stock of all foreign materials, and at the same time do a thorough job of pulping so each fiber is separated, and then quickly pass the stock to the paper machine, they will not only produce the best sheet, but it will dry easier, produce the best finish, and the best binding qualities obtainable from a given stock.

So far, no piece of equipment has been found that will equal a good breaker beater in the pulping and starting of the cleaning process of mixed paper stock. The principal requirement we want to obtain in a breaker is a fast circulation which means that the bars must be properly spaced so that we get a good dipping action of the stock, the depth from the top of the bars to the fillers between them should be very deep ,and the speed of the roll should not be too great, otherwise we will not get a full pocket of stock as the roll bar enters the stock and carries it past the back fall.

Thus far, we have found the serrating or roughing of the breaker bars in different ways has very little, if any, effect on the actual pulping of the stock. What we need mostly is a good slashing action against a rough or washboard effect back fall.

We think that a tub design wherein we pass the stock under the roll once every minute to a minute and a half is very good, and produces about the best result. If we go faster than this, the stock does not have an opportunity to soak up enough water. If we go slower, it slows down the pulping action, and of course hot water serves the purpose better than cold.

Most breakers do a more thorough job of pulping at 2½ to 3 per cent consistency, and also at this consistency we have a better chance to remove the heavy trash. At the very beginning of the pulping process, the cleaning operation should start. As the paper stock is fed into the breaker beater containing all kinds of trash and foreign material, and circulating around the tub at 2½ per cent consistency, all the heavy trash such as brick bats, paper clips, bottle caps, and the like settle to the bottom and are dragged around the bottom of the tub by the action of the stock.

If an automatic junk remover is attached a few feet in front of the roll all the heavy junk is removed. This leaves all the fine, abrasive trash such as broken bottles, gravel, sand, paper clips, pins, and the like or say anything smaller than ¼-inch go through with the paper stock.

Continuous Stock Removal

As the mixed paper stock contains very soft stock such as tissues, news, and the like and also very hard stocks such as glassine, hard sized bonds, ledgers, and the like it is customary to extract the pulped stock continuously from the breaker beater.

There are several methods of doing this, but the one used most universally and the most successful is the perforated back fall. In this the entire curved surface of the back fall that sets next to the roll is perforated with suitable sized holes. This means that since the soft stocks are pulped more quickly than the hard ones, they will pass out of the breaker beater first, but since the stock is being fed into the breaker beater continuously, the soft and hard will pass out of the breaker beater continuously, the soft and hard will pass out of the breaker after the first few minutes' run in a uniform mix.

In all mixed paper stocks there are a great many strings and rags. If no method were devised to remove them as the breaker was running, they would easily plug the entire breaker in a very short time. The usual removal process is to equip the tub with a rag catcher whereby prongs or fingers are lowered into the tub periodically, say once about every hour, and allowed to remain there for about thirty seconds, with the stock flowing between them. This allows the prongs to catch the rags as they pass. They are then raised upward a number of feet, where the rags are removed by the prongs swinging backward and passing between stationary prongs, which strip the rags off the moving prongs, allowing them to drop into a chute where they slide out of the tub channel and into a box truck. This leaves the stock pulped to a flowable condition, and free from all rags and strings, and also free from all heavy

*Presented at the 24th meeting of the Delaware Valley Section of the Technical Association of the Pulp and Paper Industry, Philadelphia, Pa., Oct. 23, 1934

[1] Shartle Bros. Machine Company, Middletown, Ohio.

trash and abrasive matter, but there is still in the stock fine sand, ground glass, paper clips, pins, and the like as well as a great deal of floating material such as pieces of cork, slivers of wood, matches, rubber bands, and the like that are carried along with the stock.

The fineness to which the stock is pulped is regulated by the size of the holes in the back fall. This does not mean if we have ¾ inch diameter holes that we will get ¾ inch, or pieces of stock this large out of it. As the blades of the breaker roll are passing the surface of the back fall on a tangent, and as a consequence are throwing the stock on a tangent from the outer periphery of the roll, and thus striking the back fall on a tangent or rather on the edge of the holes, we find that when ¾ inch holes are used in the back fall that the greater proportion of the stock will be pulped, and there will be no piece of stock greater than ½ inch in diameter.

On the other hand, if we put 9/16 inch diameter holes in the back fall, then due to this slashing action past the holes the greatest diameter piece we will get out would be about ⅛ inch.

The Settling Trough

From the breaker beater, the stock is pumped as fast as it is pulped to a settling trough, which is of a design to produce a certain rate of flowage through it. This flowage must not be too fast, or else the fine ground glass, sand, etc. will not settle to the bottom. If the trough is too deep, it would have to be unreasonably long, as it takes the abrasive matter longer to reach the bottom where it lodges. We have found to remove very fine sand and ground up glass, that the stock passing through the settling trough, no matter how long the trough might be, must not be greater than 1 per cent consistency.

If the stock is held under 1 per cent consistency, the fibers tend to separate more, and as a consequence, release this heavy material, allowing it to settle to the bottom, where it lodges along with a very small amount of paper stock. The use of baffles in a trough, we believe, only causes an eddy which does not produce a settling effect.

Have you ever noticed in a river at a riffle we never find any sand directly in back of a rock that the water flows over and around, but we do find the settling of sand some short distance back of the rock and tapering away from it. By far the most sand in a river settles at the places where the current is not too swift, and flowing slightly or just enough to carry the sand to that place and release it. This is the principle we use in settling troughs, trying to put the stock through at a certain flowage that releases all of the abrasive matter, allowing it to settle to the bottom, and not fast enough to carry it along.

After the stock passes through the settling trough, it is free from all abrasive trash of every kind, but still contains a great deal of match sticks, rubber bands, slivers of wood, cork, and the like. At this stage of the cleaning process, you will notice nearly all of the trash we want to remove is of rather a long nature, rather than round.

If we were to pass this stock through a standard screen pulped in the condition that it is, we would have to have slots about ⅛ inch wide by 3 inches long. This would pass too much of the trash we want to remove. So instead of using slots as we do in a machine screen, we use round holes of 3/16 inches and ¼ inch diameter that will let all the pulped stock through, but will not let the trash of a long nature through. As a consequence, this gives us a stock that is completely cleaned of all foreign materials.

Since from this point onward we have a very nearly all pulped, clean stock, all we have to do is thicken the stock. Or, if a still cleaner stock is desired, we can use two or three thickeners, passing the stock from one thickener to another with white water added between them, similar to a magazine deink washing system, and produce a stock that is only very slightly discolored.

All this pulping and cleaning really takes place quicker than I have been able to describe it, and if we do not make our chests under the thickeners too large and pass the stock directly from the chest through a jordan filled with ¼ inch single filling in both the plug and the shell, and speed it so we get a passage through the jordan of about four feet per second, we will get a sheet that is properly blended, has sufficient hydration, and at the same time dries very quickly.

The jordan in this case is only a help out or booster to the breaker beater, as in the breaker we are not able to disintegrate all the fibers without grinding to small pieces the trash we want to remove, and thus making it impossible to remove. From the best experience we have in the refinement of a mixed paper stock, we want a passage through the jordans in 1½ seconds.

Then the stock should pass to a second chest and from there directly to the paper machine, so that the stock is not in process from the dry mixed paper to the finished pulp more than two hours. We will have done all that is possible to do to this kind of stock, it will dry easily, with a clear, smooth finish. If we leave the stock in process too long, it becomes too badly soaked with water and is difficult to dry.

The forming effect on the cylinders, due to its excessive soaked condition gives a spotty nature, it crushes a great deal easier on the cylinders and at the presses, produces more blows, and will produce a streaked sheet.

We now come to the liner part of the sheet, which may be top, bottom, or under-liner. It is in this stock that I claim it makes no difference as to whether it is a sheet of board or of paper. The refining will be the same for a given quality.

Cutting and Hydrating

In the refining of any kind of paper stock for purposes of comparison, I will name the two extremes, first the cutting of the fiber, and second the hydration. In speaking of hydration, I am not at all sure I am using the correct word as I do not claim to be an authority on that subject, but only have ideas. From listening to you paper makers talk, I gather that the word means that in the mechanical treatment of any fiber it absorbs water and softens. The surface of the fiber begins to open up and peel, some parts are split away, and thus shortened and frayed. A fiber may be compared to a hollow tube. There are very few mills who want either of these extremes, but rather a compromise between the two.

It has been pretty well proven that to refine a paper stock suitable for paper making we must have two surfaces harder than the paper stock coming in contact, or in close contact, with each other. The kind of machine we use to do this depends upon the efficiency of the machine for a particular kind of refinement, whether cutting or hydration, that will produce the most bar contacts for the money expended on power.

To describe the two extremes, cutting and hydration, we will take cutting first. Suppose we take a thin piece of pulp a foot square and a pair of scissors and cut the pulp first in one direction so that it is about 1/64 inch strip, and then in the other direction so that we have squares about 1/64 inch. Then mix this pulp in a mortar after allowing it to soak for a couple of hours, so that it is completely disintegrated. Then make into a hand sheet. We will have as fine a sheet of blotting as you would want.

It will bulk very large, will be very spongy, will have poor bending qualities, and will soak up water like a sponge.

Going to the other extreme, "hydration," suppose we take another sheet of thin pulp about a foot square, wet it thoroughly, place it on an anvil and with a ball pean hammer strike the pulp so that there is no piece that has not been beaten or that does not show hammer marks. Then place in a mortar and disintegrate the fibers thoroughly with about a two-hour soaking. Without any farther work on it, make into a hand sheet. The result will be a piece of paper that will be tinny and very crackly. It will rattle like tin, be very hard, will have very fair bending qualities, and will be very difficult to dry. The reason is that nearly all the fibers have been thoroughly hydrated or crushed.

In both these examples, we have purposely gone to the far extreme and have really subjected the fibers to such harsh treatment that they are unsuitable for paper making for practical purposes. I have purposely exaggerated both examples to broaden the differences between the two, and thus make a greater comparison between what can actually be done and what must be done in the handling of different fibers for different kinds of paper. Never in actual paper making do we want to go as far in either direction as this illustration.

Broadly speaking of standard equipment available today to get results in actual life size paper making equipment, we have only two machines to consider, the beater and the jordan, and either of them depends on two metallic or grit surfaces coming in contact, or close contact, with the fibers in between them.

From data regarding many installations on all different kinds of fibers and paper and a great deal of experimenting we find that where we want to cut the fiber in a beater or jordan, we use a ⅛ inch thick filling, spaced rather far apart and with the tops of the wood 5/8 inch or more from the tops of the bar. This in both the plug and shell, with a peripheral speed of between 2000 and 2800 feet per minute figured in the center of the plug. With this kind of filling and with the time of passing, through the jordan of about 1½ seconds, a velocity of 4¼ feet per second, and with mean bar contacts per average fiber passing through of about 470, we get the very best cutting effect. The reason that the tops of the woods set so far below the tops of the bars is that we get a swirl effect between the bars which allows the fibers to be caught more squarely between the bars, and as a consequence a greater number of them cut.

In this cutting operation our stock should be considerably thinner than it is for hydration. The thinner stock allows it to swirl more thoroughly between the bars. On the other hand where we want to do a thorough job of hydration, we use a ⅜ inch thick triplex filling arranged in groups of three, with a ⅛ inch spacer of wood between the bars, and with a rather narrow space between the groups of bars, and a peripheral speed in the center of the plug ranging from 3000 to 4500 feet per minute. The top of the wood filler should be only about ¼ inch from the top of the bar, then, if we carry a heavy consistency stock, something around 5 to 6 per cent we get a time of passing through the jordan of about five seconds and a velocity of one foot per second.

The reason we get a good hydrated effect from this type of filling is that we have less stock being worked on at a time in the jordan, and as a consequence we have a more intensive action. The stock being thicker there are more fibers per cutting unit; the bars being in contact as the fibers are caught between them we get a crushing and fraying action. The depth from the top of the woods to the top of the bars being small we get less swirling effect, and as a consequence, the fibers pass more rapidly from one bar to the other, and at the same time by making the bars only ⅜ inch wide and then a ⅛ inch release, we do not get a chance to burn the fiber as it passes the bars, when the plug is set up tight.

You will notice that I speak of the broad, flat surface of the bar. I believe all the work done in either a jordan or a beater is on this flat surface and not on the corner of the bar; otherwise why would we get so many different results with different width bars?

One mill in particular that makes a wide variety of papers never wants the front edge or corner of the bar to be sharp, but always a little rounded. When they wish cutting action they specify about 1/64 inch radius, and for hydration about 1/32 inch radius on this corner in both the shell and plug, and they get very good results.

Refining

So far I have said nothing about pressure in a jordan. In cases of cutting I do not believe that pressure is wanted since as many voids as possible are desired. To leave the stock as free as possible, give it as much swirling effect as possible, and keep the fibers from entangling themselves so that when the bars pass in contact they will be on separated fibers, thus producing a cutting effect.

On the other hand if hydration is desired, then a pressure within the jordan is distinctly to its advantage, and when the fibers are caught between the bars they are more apt to be in groups, thus producing a greater crushing, entangling and fraying effect. They are tightly enclosed with water and as a consequence absorb more water, and since all the work is done on the flat surface of the bar, where the two bars come in contact or close contact, and with a pressure we get a cushioning effect, a duller thud or sing, and as a consequence a pounding action on the fibers, rather than the sharp cutting action.

It is very seldom that either hydration or cutting alone are wanted.

The converting of a Hollander beater into a high speed beater does not accomplish this result, since we do not get a proportionate increase of bar contacts to the increased capacity of the tub.

As an example, I have seen a sheet of kraft paper in which the stock was beaten thoroughly in a beater for three hours, 2½ hours of which time, the roll was down hard on the bed plate, and when a hand sheet was made of this stock at the time of dumping it showed a great many unpulped stock specks that had never been touched by the bars in contact with the bed plate. A single pass through a jordan eliminated these specks entirely.

However, there is one feature a beater has that is a distinct advantage, particularly, since the work we want to do on most fibers is toward the hydrating side rather than toward the cutting side. The stock after passing under the beater roll has a chance to soak, and expand, before coming in contact again. The difficulty with a beater and the thing that makes it so slow, is that we have so few bar contacts as the stock passes under the roll. We know that the work done on the fibers is in direct proportion to the mean bar contacts per average fiber passing through the refining machine, whether it be a beater or a jordan or a refiner.

As an example, take an ordinary high speed beater with a roll 56 inches diameter and 56 inches face and running at 120 r.p.m. or 1750 peripheral feet per minute, assuming eight bars in the bed plate, the contacts with each bar of the roll with the bed plate would be 1,350,720 square inch contacts per minute, and the estimated horsepower on

six per cent consistency stock would be about 60.

Now, compare this with our No. 4 refiner. In this refiner running at 860 r.p.m., which is the standard speed, we get 25,419,200 square inch bar contacts per minute with an estimated horsepower requirement on 6 per cent stock of 180. This gives us 5½ times more square inch bar contacts per horsepower hour in the refiner than in a beater, and we can get exactly the same results as in a beater, in that we pass the stock through the refiner, then into the tub of the refiner for soaking and expansion, then to the refiner again and so on just exactly the same as we do in a beater, except that in the passage of the stock through the refiner we get 5½ times more contacts than in a beater.

To compare the work accomplished. The beater on a certain kind of stock will bring that stock to a freeness of 200 cc. in about four hours, when measured with a Schopper freeness tester, whereas the refiner will bring the same stock to the same freeness in about thirty minutes.

The stock from the beater will have a few lumps of unrefined stock whereas the refiner will entirely eliminate them, as shown in a hand sheet.

A New Refiner

If we were to design a mill in theory we would have a series of jordans. First, there would be a breaker beater to pulp the stock, then the stock passed to a chest. From this chest the stock is passed to a jordan, then to another chest, then to a jordan, then to another chest, and so on until we had enough jordans to suit the refining requirements of the mill for the particular fiber we were handling. This would give us the fiber contacts with the bars, then a chance for the stock to expand, absorb water between each of the refinements. Then, if each of the jordans were set up just enough to give the required amount of refinement; that is, the first jordan would probably be 1/16 inch between the plug bars and the shell bars, the next one would be set up a little more, and so on until we had actual contact.

It would be impractical to design a mill in this way, because of the great number of passes that would be required, but we are certain it is the right theory in the refining of practically any kind of stock.

We have eliminated the need for the long series of jordans by our new pulper and refiner, and we can accomplish exactly the same results with it. In this refiner and its connecting tub we do not use the conventional Hollander design of beater.

We know that to speed up the travel of the stock in the beater, we must give a steep slope to the bottom of the tub, so in constructing a tub for the refiner, we have used a slope on the bottom that is far beyond anything that had ever been used in a beater.

In a beater design you will find that the vertical distance from the bottom of the tub directly in front of the roll to the bottom of the tub directly in back of the back fall is only at the most about three feet. In designing the tub for our refiner we have made this distance between the high level of the bottom of the tub and the low level of the bottom of the tub about eight feet, the inlet end of the pulper and refiner is connected to the low level of the tub. The outlet of the pulper and refiner is connected to the high level of the tub. As a consequence we get a very fast circulation.

We can circulate stock of 12 per cent consistency in this design of tub as fast as 6 per cent stock can be circulated in a high speed beater.

The tub will hold as much as 10,000 pounds of stock and the entrances to the refiner and the outlets are arranged so that they are not restricted in any manner. The whole volume of stock travelling around the tub enters the pulper part of the refiner, and in this we get not only a thorough pulping of the stock, but also a thorough mixing. The volume of stock moving around the tub is 8,000 gallons per minute. This volume enters the pulper part of the machine and is discharged at the rate of 7,200 gallons per minute. The other 800 gallons passes through the refiner and back into the tub into the same place that the pulper part is discharging.

This means that we have the same principie as a high speed beater, except that we have more bar contacts per passage through the refiner and we get just as many passes of a fiber, through the refiner, as we do through a beater, and we also get exactly the same principle as a series of jordans strung out as described above, and with the stock passing from one jordan to a chest, then to another jordan, then to a chest, and so on. The stock after passing through the refiner passes back to the tub, circulates with the balance of the stock, and again enters the refiner, etc.

In addition to this, we get an additional advantage, in that the refiner has a steep spiral filling in both the plug and shell. Here we use single bars, but spiralled around and a little wider than we use for pure cutting purposes. This spiralling of the filling enables us to produce an internal pressure as high as 35 pounds within the refiner, and while we have a deep depth of bar, this is off-set by the spiral in the plug and shell crossing each other, which produces an effect the same as a shallow depth. As a consequence, we get either a cutting or hydrating action, depending on how much pressure we allow within the refiner and on how close the plug and shell bars are in contact with each other.

In this refiner we have passed 100 tons of kraft stock per 24 hours with a distinct refining advantage to the stock. At 860 r.p.m. we get a mean velocity through the refiner of 7¼ feet per second, a velocity of the stock leaving the plug and shell of 3.65 feet per second, or a mean velocity at the center of the plug of 7.27 feet per second.

The length of travel through the machine is 30 inches. It requires one-half second for a given fiber to pass through the machine. The mean bar contacts per average fiber passing through is 252, and the square inch bar contacts are 25,419,200 per minute as against less than 2,000,000 on a beater. The difference between this refiner and the beater or a jordan is that we are giving the stock that goes through this refiner so many more bar contacts than can possibly be given in either a jordan or beater.

Furthermore, we build the tub of the refiner and pulper of a size, such that we can connect one, two, three, or four refiners to it. The pulper part of the machine still has a capacity to pulp this quantity of stock, the stock passing through each of them in parallel so we can give any amount of refining desired on a soft or hard stock.

On a kraft or Mitscherlich stock, or any other hard stock where we require a great deal of refining for a given capacity mill we connect these refiners to the tub and thus get the same results as though we had a beater with a tub of great length and with a number of rolls in it, which would give a soaking, expansion, and air expelling effect between each of the rolls.

In other mills where the stocks are of a softer nature such as sulphite, we put on only one refiner and the results are very much better, quicker, and less horsepower than can possibly be accomplished with any beater or jordan installation we have ever seen.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING NOVEMBER 10, 1934

CIGARETTE PAPER

Max Spiegel Son, Pr. Harrison, Genoa, 50 bls.; De Manduit Paper Corp., Pr. Roosevelt, Havre, 161 cs.

WALL PAPER

R. F. Downing & Co., Pr. Pierce, Kobe, 14 bls.

NEWSPRINT

——, Idefjord, Oslo, 214 rolls; H. G. Craig Co., Inc., Domacona #1, Montreal, 583 rolls; Perkins Goodwin & Co., New York, Hamburg, 48 rolls.

PRINTING PAPER

International F'd'g Co., Black Hawk, Antwerp, 4 cs.

WRAPPING PAPER

J. B. Mast & Co., Rex, Genoa, 6 cs.; Steiner Paper Corp., New York, Hamburg, 44 cs.

PACKING PAPER

Scharf Bros., Inc., Black Eagle, Rotterdam, 11 cs.; Diugelstedt & Co., Black Hawk, Antwerp, 1 cs.

KRAFT PAPER

Walker, Goulard, Plehn Co., Pr. Roosevelt, Hamburg, 347 rolls; ——, Pr. Roosevelt, Hamburg, 220 bls.

FILTER PAPER

Orbes Products Trading Co., Aquitania, Southampton, 7 bls.; H. Reeve Angel & Co., Inc., Amer. Merchant, London, 7 cs.; Satisfaction Supply Co., Pr. Roosevelt, Havre, 5 cs.

DRAWING PAPER

Richard Art Color Co., Chr. Sass, Marseilles, 2 cs.; H. Reeve Angel & Co., Inc., Amer. Merchant, London, 2 cs.

SURFACE COATED PAPER

Chas. Happel, New York, Hamburg, 9 cs.; Atlantic F'd'g Co., New York, Hamburg, 18 cs.

PHOTO PAPER

Medo Photo-Supply Co., Aquitania, Southampton, 1 cs.; J. J. Gavin & Co., Aquitania, Southampton, 5 cs.

DECALCOMANIA PAPER

B. F. Drankenfeld & Co., Scythia, Liverpool, 28 cs. (duplex).

DECALCOMANIAS

Sellers Transportation Co., Bremen, Bremen, 19 cs.

TRANSFER PAPER

Rohner Gehrig & Co., Bremen, Bremen, 17 cs.

TISSUE PAPER

B. F. Drakenfeld & Co., Scythia, Liverpool, 4 cs.; Jay Madden Corp., New York, Hamburg, 23 bbls.

MISCELLANEOUS PAPER

Horman Schulte & Co., Pr. Harrison, Genoa, 3 cs.; Keller Dorian Paper Co., Pr. Harrison, Marseilles, 2 cs.; J. H. Rhodes, Ile de France, Havre, 1 cs.; E. Fougera & Co., Ile de France, Havre, 20 cs.; Almo Trading Co., Ile de France, Havre, 19 cs.; Keuffel & Esser Co., Pr. Roosevelt, Hamburg, 27 cs.

RAGS, BAGGING, ETC.

Chase National Bank, Black Eagle, Rotterdam, 52 bls. cotton waste; ——, Black Hawk, Antwerp, 51 bls. cotton waste; Darmstadt Scott & Courtney, Black Hawk, Antwerp, 60 bls. bagging, 59 bls. paper stock; Leigh Textile Co., Black Hawk, Antwerp, 85 bls. cotton waste; Royal Manf'g Co., Black Hawk, Antwerp, 81 bls. cotton waste; S. W. Miller & Co., Inc., Black Hawk, Antwerp, 188 bls. flax waste; ——, Amer. Shipper, Manchester, 151 bls. cotton waste; S. Schapera & Son, Kosciusko, Gdynia, 196 bls. jute waste; Chase National Bank, Kosciusko, Gdynia, 88 bls. rags; Continental Bank Trust Co., Chr. Sass, Barcelona, 66 bls. rags; ——, Chr. Sass, Barcelona, 48 bls. cotton waste, 166 bls. bagging; Chase National Bank, Livenza, Genoa, 62 bls. rags; Manufacturers Trust Co., New York, Hamburg, 45 bls. cotton waste.

OLD ROPE

A. S. Wilson, Inc., Boston City, Bristol, 157 coils; Chase National Bank, Boston City, Bristol, 196 coils; Chase National Bank, City of Flint, London, 56 coils.

CASEIN

American British Chemical Supplies, Amer. Legion, Buenos Ayres, 417 bags.

CHINA CLAY

Orbis Products Trading Co., Amer. Shipper, Liverpool, 112 bags; Moore & Munger, Sea Victory, Fowey, 1426 tons, 3 cwt.; English China Clays Sales Corp., Sea Victory, Fowey, 112 tons, 15 cwt.

WOOD PULP

Chemical Bank Trust Co., Idefjord, Oslo, 350 bls. sulphite; Irving Trust Co., Idefjord, Oslo, 900 mechanical;

Perkins Goodwin & Co., Idefjord, Oslo, 550 bls. sulphite; The Borregaard Co., Inc., United States, Oslo, 370 bls. wood pulp, 62 tons; ——, Pr. Roosevelt, Hamburg, 120 bls. wood pulp, 13 tons; M. Sone, New York, Hamburg, 330 bls. wood pulp, 53 tons; Bulkley Dunton & Co., Hamburg, ——, 125 bls. wood pulp, —.

ALBANY IMPORTS

WEEK ENDING NOVEMBER 10, 1934

Halifax Power & Pulp Co., Sekstant, Clark City, 7683 bls. ground pulp, 1440 tons; Halifax Power & Pulp Co., Sekstant, Sheet Harbor, 1963 bls. ground pulp, 437 tons; Halifax Power & Pulp Co., Sekstant, Sheet Harbor, 754 bls. pulp screenings, 169 tons; International Paper Co., Tela, Gaspe, 1700 cords pulpwood.

PORTLAND IMPORTS

WEEK ENDING NOVEMBER 10, 1934

Gottesman & Co., Inc., Uddeholm, Sweden, 2250 bls. wood pulp; Buckley Dunton & Co., Uddeholm, ——, 2500 wood pulp; Buckley Dunton & Co., Karpfanger, ——, 3000 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING NOVEMBER 10, 1934

Irving Trust Co., Black Hawk, Antwerp, 50 bls, bagging; Meredith Linen Mills, Black Hawk, Antwerp, 87 bls. flax waste; Royal Manuf'g Co., Black Hawk, Antwerp, 141 bls. cotton waste; ——, Scythia, Liverpool, 554 bgs. hide cuttings; G. F. Malcolm, Inc., Scythia, Liverpool, 11 cs. tissue paper; Gottesman & Co., Inc., Uddeholm, Sweden, 930 bls. wood pulp; Parsons & Whittemore, Inc., Westerwald, ——, 375 bls. sulphite pulp.

PHILADELPHIA IMPORTS

WEEK ENDING NOVEMBER 10, 1934

R. Blank, Black Hawk, Antwerp, 225 bls. rags; Darmstadt, Scott & Courtney, Black Hawk, Antwerp, 762 bls. rags; 1st National Bank of Boston, Boston City, Bristol, 77 coils old rope; Castle & Overton, Inc., Uruguayo, Buenos Ayres, 506 bls. rags; Irving Trust Co., City of Flint, Hamburg, 150 bls. wood pulp, 25 tons; ——, City of Flint, Bremen, 160 bls. rags; ——, Liverpool Lauger, Liverpool, N. S., 1495 bls. wood pulp; Castle & Overton, Inc., West Eldara, Rotterdam, 204 bls. wood pulp.

BALTIMORE IMPORTS

WEEK ENDING NOVEMBER 10, 1934

Moore & Munger, Sea Victory, Fowey, 533 tons, 17 cwt., china clay; English China Clay Sales Corp., Sea Victory, Fowey, 261 tons, 9 cwt. china clay; ——, City of Flint, London, 55 coils old rope; New York Trust Co., Binnendyk, Rotterdam, 1080 bls. wood pulp; National City Bank, Binnendyk, Rotterdam, 75 bls. rags; M. Sone, Uddeholm, Gothenburg, 2400 bls. wood pulp; Gottesman & Co., Inc., Uddeholm, Sweden, 1250 bls. wood pulp; Parsons & Whittemore, Inc., Uddeholm, ——, 650 bls. sulphite pulp; Parsons & Whittemore, Inc., City of Baltimore, ——, 125 bls. sulphite pulp; Bulkley Dunton & Co., Etna, ——, 1750 bls. wood pulp.

NEWPORT NEWS IMPORTS

WEEK ENDING NOVEMBER 10, 1934

Bulkley Dunton & Co., Etna, ——, 2250 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING NOVEMBER 10, 1934

R. J. Reynolds Tobacco Co., Binnendyk, Rotterdam, 1384 cs. cigarette paper.

CHARLESTON IMPORTS

WEEK ENDING NOVEMBER 10, 1934

W. Garretson, Norfolk Maru, Shanghai, 206 bls. bagging.

SAVANNAH IMPORTS

WEEK ENDING NOVEMBER 10, 1934

——, Norfolk Maru, Kobe, 300 bls. bagging.

NEW ORLEANS IMPORTS

WEEK ENDING NOVEMBER 10, 1934

Gottesman & Co., Inc., Wido, Sweden, 175 bls. wood pulp.

Pulp Strikers Return to Work

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., November 12, 1934—Striking bushmen in the Iroquois Falls district were headed back to their jobs this week without receiving acceptance of any of their demands by the Abitibi Power and Paper Company. The walk-out was broken during the week-end when bushmen drifted back to camps. During the lengthy idleness of the workers the company refused to negotiate with the unions backing the strike. Demands for increased wages were considered too great. About 230 men have left for their jobs to work under the old conditions and wage schedules. Accompanying the men to their jobs were sixteen policemen. A number of disturbances marked the Iroquois Falls strike, which came to a conclusion following the return to work of strikers in the Cochrane district and Algoma camps of the Abitibi company.

Charles W. Chabot Dead

Charles W. Chabot, vice president of Ladson-Butler, Inc., formerly connected with the Hammermill Paper Company, of which he had been a vice president, died unexpectedly last week of thrombosis in his home on Bellair Drive in the Riverview Manor section of Dobbs Ferry, N. Y.

He was 53 years old. He attended public school and the Mechanic Arts School in Boston. He leaves a widow, the former Abbie Babb of Boston; his mother, Mrs. Carrie Chabot; a brother, Ernest, and two sons, Charles W., 3rd and Eben Babb.

L. R. Mahrt To Be in Charge of Paper Work

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 14, 1934.—Louis R. Mahrt, of Dayton, Ohio, has joined the Industrial Advisory Board of NRA in charge of the paper work for that board. Since 1920 Mr. Mahrt has been engaged in general practice of law. Before coming to Washington he was a partner in the firm of Nolan, Bingel & Mahrt, of Dayton, Ohio.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, November 14, 1934.

Demand for the various grades of paper is becoming more persistent now that the year is drawing to a close. Sales forces of the leading paper organizations are generally optimistic regarding the immediate future, at least. Prices are holding to previously quoted levels, in most instances.

The bright particular feature of the week in the newsprint paper market was the action of the International Paper Company in raising its contract prices for the first six months of the forthcoming year $2.50 per ton, with an additional advance of $2.50 per ton for the last six months of the year.

Conditions in the fine paper market are more promising. Demand for book, cover and writing papers is brisk. Prices are holding to schedule. Tissues are moving freely. The coarse paper market is sharing the general improvement, with specialties going forward at a steady pace. The paper board market is fairly active.

Mechanical Pulp

The ground wood pulp market is marking time. Manufacturing operations in the United States, Canada and abroad are practically keyed to consumption and the statistical position of the industry is sound. Quotations on both domestic and imported mechanical pulp are holding to schedule without difficulty.

Chemical Pulp

Steadiness prevails in the chemical pulp market. Demand for both domestic and imported grades is fairly active. Prices are well sustained. Bleached sulphite is quoted at from $2.75 to $2.85 per 100 pounds, on dock, Atlantic, Gulf and West Coast ports and all prime easy bleaching at $2.25.

Old Rope and Bagging

The old rope market is exhibiting a stronger undertone. Both foreign and domestic old manila rope are firmer. Small mixed rope is rather quiet. The bagging market is also displaying strength. Gunny and scrap bagging are steadier, while roofing bagging is in seasonal request.

Rags

Some improvement was noticed in the domestic rag market. Demand for new cotton rags is holding up well, especially for No. 1 white shirt cuttings and fancy shirt cuttings. Roofing grades are in better request. The uncertainty of the foreign exchange situation is still affecting the imported rag market.

Waste Paper

The paper stock market is practically unchanged. There is a strong movement among the mill supply dealers in favor of retaining the established minimum prices on the lower grades and several petitions have been forwarded to Washington appealing for an extension of the emergency recently declared.

Twine

Trading in the local twine market is more active. The number of inquiries around for future requirements indicates an expansion of demand from now on until the end of the year. Despite the usual keen competition for desirable orders quotations on the various varieties of twine are steady and unchanged.

American Tissue Sales Up

[FROM OUR REGULAR CORRESPONDENT]

SOUTH HADLEY, Mass., November 12, 1934—The American Tissue Mills, Inc., is establishing a new record this season on sales of holiday gift wrappers and has also increased its production of fancy paper napkins, for which additional equipment was recently installed. Sales of the company this season have run about 20 per cent ahead of 1933. Decorated cardboard plates have been added as a new line.

New Rag Content Brochure

The Rag Content Paper Manufacturers, including 29 concerns, 122 East 42nd street, New York, are sending to paper merchants a brochure entitled, "Why Rag Papers?", setting forth reasons for handling such papers. The brochure is profusely illustrated in colors, showing names of some companies which use rag content papers. The manufacturers are also issuing a booklet entitled "Making the Most with the Best," which indicates to printers advantages of rag papers.

Sulphate Pulp and Board Budget

The Executive Authority for the Sulphate Pulp and Board Division of the Paper and Pulp Industry has made application to the National Industrial Recovery Board for approval of its budget for, and of the basis of contribution by members of the said Division of said Industry to, the expense of administering the Code for the period from March 1, 1934 to February 28, 1935.

The total amount of the budget is $16,000. The basis of contribution shall be as follows:

"The basis for assessment shall be at the rate of $0.025 per ton of board shipped. Invoices issued monthly based on tonnage shipped during previous month. Rate determined on anticipated annual shipments of 640,000 tons divided into Budget of $16,000."

A copy of the budget is available upon request at the office of the National Recovery Administration, Room 3314, Department of Commerce Building, Washington, D. C., and at the office of the Executive Authority for the Sulphate Pulp and Board Division of the Paper and Pulp Industry, 122 East 42nd Street, New York City.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, November 14, 1934.

BLANC FIXE.—The position of the blanc fixe market is practically unchanged. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45 per ton, in bulk; while the powder is selling at from 3½ cents to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—Conditions in the bleaching powder market are fairly satisfactory. The contract movement is normal for the time of year. Prices remain unchanged. Bleaching powder is quoted at from $1.90 to $2.15 per 100 pounds, in drums, at works.

CASEIN.—The casein market is quiet. Domestic standard ground is quoted at 9½ cents and finely ground at 10½ cents per pound; while Argentine standard ground is selling at 14 cents and finely ground at 14½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Demand for caustic soda is fairly persistent. Prices are steady and unchanged. Solid caustic soda is quoted at from $2.60 to $3.10; while the flake and ground are selling at from $3 to $3.05 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is fairly active. Contract shipments are moving freely. Imported china clay is quoted at from $13.50 to $21 per ton, ship side; while domestic paper making clay is selling at from $6.50 to $12 per ton, at works.

CHLORINE.—Steadiness prevails in the chlorine market. The contract movement is well up to average. Prices are holding to schedule. Chlorine is quoted at from $2 to $2.40 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is fairly steady. Paper making gum rosin is quoted at $4.20 and FF wood rosin at $4.30 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $2.51 per 100 pounds, in tank cars, at works.

SALT CAKE.—Business in the salt cake market is holding up well. Prices are steady. Salt cake is quoted at from $12 to $14, and chrome salt cake at from $12 to $12.50 per ton, at works. Imported salt cake is selling at from $12 to $12.50 per ton, at works.

SODA ASH.—The soda ash market is exhibiting a strong undertone. Contracts for 1935 are being booked in good volume. Quotations on soda ash, in car lots, at works, per 100 pounds, are still as follows: in bulk, $1.10; in bags, $1.40; and in barrels, $1.50.

STARCH.—No further changes were reported in the starch market. Demand from the paper mills is fairly active. Prices are steady. Special paper making starch is selling at $3.47 per 100 pounds, in bags; and at $3.74 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—The sulphate of alumina market is displaying strength. Prices are holding to schedule. Commercial grades are still quoted at from $1.35 to $1.50; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market is steady. Sulphur is quoted at $18 per long ton on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and near by car loads the quotation is $21 per ton.

TALC.—Trading in the talc market is moderately active. Prices are holding to previously quoted levels. Domestic talc is selling at from $16 to $18 per ton, in bulk, at eastern mines; while imported talc is offered at from $23 to $30 per ton, on dock.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@	—
Bonds	6.00	@	—
Index	6.00	@	—
Writings—			
Extra Superfine	6.50	@	—
Superfine	6.25	@	—
Tub sized	5.75	@	—
Engine sized	5.50	@	—
Book, Cased—			
S. & S. C.	5.35	@	5.75
S. & S. C. Litho.	5.60	@	6.00
M. F.	5.10	@	5.50
Coated and Enamel	5.90	@	6.55
Coated Litho	5.90	@	6.55
Tissues—Per Ream—			
White No. 1	.82½	@	.85
White No. 2	.67½	@	—
Anti-Tarnish M. G. only	1.00	@	—
Colored	.85	@	—
Kraft	.70	@	—
Manila	.67½	@	.70
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	4.00	@	4.50
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.50	@	3.50
Glassine—			
Bleached	.11	@	—
Unbleached	.09	@	—

(The following Quotations are Delivered New York)

News, per ton—			
Roll, contract	40.00	@	—
Rolls, spot	40.00	@	—
Sheets	45.00	@	—
Kraft—			
No. 1 Domestic	4.75	@	5.00
No. 2 Domestic	3.87½	@	—
Southern	3.87½	@	—
Boards—per ton—			
News	40.00	@	45.00
Chip	37.50	@	40.00
Sgl. Mla. Ll. Chip	47.50	@	52.50
Jute Lined Chip	47.50	@	52.00
White Patent Coated	60.00	@	65.00
Binders Boards	67.00	@	75.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	22.00	@	24.00
Dry	23.00	@	24.00
(F.o.b. Mill)			
No. 1 Domestic and Canadian	22.00	@	26.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Division 1	2.85	@	—*
Division 2	2.80	@	—*
Division 3	2.75	@	—*
Prime Qualities—			
Class 1. All Prime Easy Bleaching	2.25	@	—*
Other Than Easy Bleaching—			
Class 2. Higher Than Standard	2.20	@	—*
Class 3. Standard	2.15	@	—*
Class 4. Lower than Standard	2.10	@	—
(On Dock, Atlantic Ports)			
Kraft No. 1	1.70	@	1.80
Kraft No. 2	1.55	@	1.65
(F.o.b. Pulp Mill)			
Kraft Domestic	1.60	@	2.25
(Delivered)			
Soda Bleached	2.50	@	—

*Add 60 Cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	5.75	@	6.00
Silesias No. 1	3.75	@	4.00
New Unbleached	6.25	@	6.50
New Soft Blacks	3.00	@	3.25
Blue Overall	3.50	@	3.75
Fancy	2.50	@	2.75
Washables	1 75	@	2.00
Mixed Khaki Cuttings	3.00	@	3.25
O. D. Khaki Cuttings	3.75	@	4.00
Men's Corduroy	1.50	@	1.75
New Mixed Blacks	2.50	@	2.75

Old Rags

White, No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	@	3.25
White, No. 2—			
Repacked	1.75	@	2.25
Miscellaneous	1.50	@	1.75
Thirds and Blues—			
Repacked	1.50	@	1.75
Miscellaneous	1.25	@	1.50
Black Stockings	2.50	@	3.00
Roofing Rags—			
No. 1	1.10	@	1.25
No. 2	.80	@	.85
No. 3	.70	@	.75
No. 4	.65	@	.70
No. 5A	.60	@	.65

Foreign Rags

New Rags

New Dark Cuttings	1.60	@	1.70
New Mixed Cuttings	1.75	@	1.85
New Light Silesias	3.75	@	4.00
Light Flannelettes	3.75	@	4.00
Unbleached Cuttings	6.50	@	6.75
New White Cuttings	6.50	@	6.75
New Light Oxfords	3.25	@	3.50
New Light Prints	2.75	@	3.00

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00
No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.90	@	2.15
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	1.75	@	1.85
French Blue Linens	2.30	@	2.40
German Blue Linens	2.15	@	2.25
German Blue Cottons	1.70	@	1.80
Checks and Blues	1.30	@	1.40
Linsey Garments	1.40	@	1.60
Dark Cottons	1.00	@	1.10
Old Shopperies	.95	@	1.00
New Shopperies	.90	@	1.00
French Blues	1.70	@	1.80

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.50	@	1.60
Domestic	1.40	@	1.50
Wool Tares, light	1.20	@	1.30
Wool Tares, heavy	1.20	@	1.30
Bright Bagging	1.15	@	1.25
Manila Rope—			
Foreign	1.85	@	2.00
Domestic	1.75	@	2.00
Small Mixed Rope	1.10	@	1.35
New Burlap Cut	2.00	@	2.25
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.70	@	2.80
Ordinary Hard White No. 1	2.15	@	2.25
Hard White No. 2	1.95	@	2.05
Soft White No. 1	1.85	@	1.95
Flat Stock—			
Stitchless	.80	@	.90
Over issue Mag.	.80	@	.90
Solid Flat Book	.65	@	.75
Crumpled No. 1	.60	@	.65
Solid Book Ledger	1.50	@	1.65
Ledger Stock	1.00	@	1.10
New B. B. Chips	.30	@	.35
Manilas—			
New Env. Cut	1.70	@	1.80
New Cuttings	1.35	@	1.45
Print	Nominal		
Bogus Wrapper	.40	@	.50
Container	Nominal		
Old Kraft Machine—			
Compressed bales	1.10	@	1.20
News—			
No. 1 White News	1.20	@	1.30
Strictly Overissue	.65	@	.70
Strictly Folded	.42½	@	.50
No. 1 Mixed Paper	.32½	@	.40

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PORT HURON MICHIGAN

Twines
(F. o. b. Mill)

Coarse Polished—			
India	.11¼	@	.13¾
Belg. White Hemp	.12½	@	.15¾
India Compress	.11¾	@	.12¼
Fine Polished—			
Fine India	.16	@	.20
Special	.16	@	.18
B. C.	.25½	@	.27½
Unpolished—			
Box	.10	@	.10½
Paper Makers	.07	@	.11½
Tube Rope	.08	@	.13½
Wall Paper	.09	@	.12½
Wrapping	.12	@	.17
Special	.12	@	—
Soft Fiber Rope	.10¼	@	.10¾

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.12	@	.50
Water Marked Sulphite Bond	.06¾	@	.11
Sulphite Bond	.05½	@	.11
Superfine Writing	.18	@	.24
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¼	@	.07¼
No 2 S &S.C. Book	.05¼	@	.06½
Coated Book	.07	@	.12
Coated Label	.07	@	.08½
No. 1 Manila	.04¼	@	.05¼
No. 1 Fibre	.04¼	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	4.75	@	5.00
Southern Kraft	3.88	@	4.25
No. 2 Kraft	3.88	@	4.25
Wood Tag Boards	.04¾	@	.06¼
Sulphite Screenings	.03	@	.03¾
Manila Tissue	.05¾	@	.07
White Tissue	.07	@	.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	41.00	@	—
Sheets, open	46.00	@	51.00
Boards, per ton—			
Plain Chip	46.50	@	—
Solid News	50.00	@	—
Manila Lined Chip	55.00	@	—
Patent coated	65.00	@	—
Container Lined—			
85 Test, per 1000 sq. ft			1.70
100 Test, per 1000 sq. ft			1.85

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope cuttings	1.70	@	2.00
No. 1 Hard White	1.40	@	1.65
No. 1 Soft White	1.25	@	1.50
Ledger & Writings	.70	@	.80
Solid Books	.60	@	.70
Blanks	1.00	@	1.05
Kraffs	.80	@	.90
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	.90	@	1.00
Print Manila	.50	@	.55
Overissue News	.60	@	.70
Old Newspapers—			
No. 1	.50	@	.55
Mixed Papers—			
No. 1	.30	@	.35
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(Delivered Philadelphia)

Bonds	.05-9/10	@	.38
Ledgers	.06 9/10	@	.40
Writings—			
Fine No. 3	.05	@	.06
Superfine	.10	@	.18
Extra Fine	.15	@	.20
Fine	.15	@	.25
Fine, No. 2	.10	@	.25
Book, M. F.	.05¼	@	.06¼
Book, S. S. & C.	.05	@	.07½
Book, Coated	.06½	@	.09
Coated Lithograph	.06¾	@	.08½
Label	.07	@	.11
No. 1 Jute Manila	6.25	@	—
Manila Sul., No. 1	5.25	@	—
Manila No. 2	3.00	@	—
No. 1 Kraft	5.00	@	—
Southern Kraft	4.75	@	—
Common Bogus	.03	@	.04½
News Print Rolls	46.00	@	55.00
Straw Board	40.00	@	45.00
News Board	50.00	@	—
Chip Board	45.00	@	—
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.65
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.03½	@	.04
New White, No. 2	.02½	@	.04
Light Silesias	.02½	@	.03
Silesias, No. 1	.03	@	.03½
Black Silesias, soft	.02½	@	.03
New Unbleached	.05	@	.05½
Washable, No. 1	.01½	@	.02
Blue Overall	.03½	@	.04
Cottons—According to grades—			
Washable, No. 2	.02½	@	.03
New Blue	.01½	@	.03
Fancy	.01½	@	.03
New Black Soft	.02	@	.04
New Light Seconds	.01½	@	.02
New Dark Seconds	1.50	@	1.75
Khaki Cuttings—			
No. 1 O.D.	.03	@	.04
No. 2 Mixed	.03	@	.04
Corduroy	.02	@	.03
New Canvas	.03½	@	.04½
New Black Mixed	.02½	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.50
Miscellaneous	1.75	@	2.25
M. G.	3.00	@	3.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.50
Repacked	1.50	@	2.00
Black Stockings (Export)	2.00	@	3.50
Roofing Stock—			
Foreign No. 1	.50	@	.75
Repacked	.70	@	.85

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	1.75
Manila Rope	2.00	@	2.25
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.25	@	2.30
No. 2 Hard White	1.90	@	2.00
No. 1 Soft White	1.80	@	1.85
No. 2 Soft White	1.25	@	1.30
No. 1 Mixed	—	@	.75
Solid Ledger Stock	1.50	@	1.60
Writing Paper	1.10	@	1.20
No. 1 Books, heavy	.65	@	.70
No. 1 New Manila	1.35	@	1.40
Print Manila	.50	@	.60
Container Manila	.45	@	.50
Old Kraft	1.15	@	1.20
No. 1 Mixed Paper	.32½	@	—
Straw Board Chip	.30	@	—
Binders Board Chip	.30	@	—
Corrugated Board	.50	@	—
Overissue News	.60	@	—
Old Newspapers	.42½	@	—

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.07¾	@	.11
Rag Content	.12	@	.40
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¾	@	.05
No. 2 Kraft	.03¾	@	.04½
(F. o. b. Boston)			
Southern Kraft	.03¾	@	.04½
(F. o. b. destination in carload lots, l. c. l. mill in less than carload lots.)			
Common Bogus	.02	@	.02¼
(Delivered New England points)			
News Print, rolls	44.50	@	—
Straw Board, rolls	.009	—	@35.00
Straw Board in Sheets, basis 35s to 70s	—	@40.00	
Filled News Board	40.00	@45.00	
Chip Board	37.50	@40.00	
Chip Board (Creasing)	37.50	@40.00	
Single Manila Lined Chip	47.50	@52.50	
Single White, Patent Coated News Board (Bender)	57.50	@65.00	
Wood Pulp Board	70.00	@75.00	
Binder Boards (Standard Grade)	67.00	@75.00	

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.00	@	2.25
No. 1 Soft White	1.75	@	2.00
No. 2 Mixed	.80	@	.85
Solid Ledger Books	1.75	@	—
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.95	@	1.05
No. 1 Books, heavy	.85	@	.90
No. 1 Books, light	.65	@	.75
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.25	@	1.30
No. 1 Old Manila	.65	@	.70
White Blank News	1.10	@	1.15
No. 1 Kraft	1.05	@	1.10
Manila	.55	@	.60
No. 1 Mixed Papers	.32½	@	—
Print Manila	.45	@	.50
Overissue News	.50	@	.55
Old Newspapers	.42½	@	.45
Box Board Chips	..	@	.25
Corrugated Boxes	.32½	@	.40
Screening Wrappers	.50	@	.60

Bagging
(F. o. b. Boston)

Manila Rope—			
Foreign	1.75	@	1.90
Domestic	1.90	@	2.00
Transmission Rope	.90	@	1.00
Mixed Strings	.30	@	.37½
Jute Rope	1.35	@	1.40
Jute Carpet Threads	.65	@	.70
Gunny No. 1—			
Foreign	1.50	@	1.60
Domestic	1.15	@	1.20
Bleachery Burlap	4.00	@	4.50
Scrap Burlap	1.05	@	1.10
Scrap Sisal	1.00	@	1.10
Scrap Sisal for Shredding	1.10	@	1.25
Wool Tares, heavy	1.25	@	1.30
New Burlap Cuttings	1.45	@	1.50
Australian Wool Pouches	2.00	@	2.25
Heavy Baling Bagging	1.40	@	1.50
Paper Mill Bagging	.90	@	1.10
Bagging No. 2	.50	@	.55

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.01¾	@	.02
New White No. 1.	.05½	@	.06
New White No. 2.	.03½	@	.04
Silesias No. 1	.04	@	—
New Black Silesias	.02½	@	.03
New Unbleached	.05½	@	.06
Blue Cheviot	—	@	4.65
Fancy	—	@	.02½
Washable	.02¼	@	—
Cottons—According to grades—			
Blue Overalls	—	@	.03½
New Black, soft	.04	@	.04½
Khaki Cuttings	.03	@	.03¼
O. D. Khaki	.02¾	@	.03
Corduroy	.01¾	@	.02
New Canvas	—	@	.05
B.V.D. Cuttings	—	@	.06½

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	.—	@	3.00
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	2.00	@	2.75
Miscellaneous	2.00	@	2.25
Twos and Blues	1.25	@	1.50
Thirds and Blues			
Repacked	2.00	@	2.75
Miscellaneous	2.00	@	2.25
Black Stockings	2.25	@	2.50
Roofing Stock			
No. 1	.70	@	.75
No. 2	.65	@	.70
No. 3	.55	@	.60

Foreign Rags
(F. o. b. Boston)

Dark Cottons	.85	@	.95
New White Shirt Cuttings	5.50	@	6.00
Dutch Blues	2.00	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.55	@	1.60
Old Linsey Garments	1.25	@	1.35

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¾	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.10¾	@	—
No. 2 Colored	.09	@	.10
Ledgers (sulphite)			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.20	@	—
No. 3 M. F. (Carloads)	5.70	@	—
No. 4 M. F. (carloads)	4.75	@	—
No. 1 S. C. (carloads)	6.65	½	—
No. 3 S. C. (carloads)	6.20	@	—
No. 4 S. C. (carloads)	5.20	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.25	@	—
White Wrap	2.22½	@	—
"B" Manila	4.75	@	—
No. 1 Manila	5.25	@	—
Fiber	5.25	@	—
Kraft, M. F.	5.75	@	—
Kraft No. 2	5.25	@	—

(F.O.B. Cars Toronto)

News, per ton—			
Rolls (contract)	39.50	@	—
Sheets	44.50	@	—

Pulp
(F. o. b. Mill)

Ground Wood	18.00	@	20.00
Sulphite easy bleaching	40.00	@	—
Sulphite, news grade	38.00	@	—
Sulphite, bleached	50.00	@	55.00
Sulphate	50.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00	@	2.30
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	1.00
Light and Crumpled Book Stock	.80	@	.90
Ledgers and Writings	1.00	@	1.05
Manilas—			
New Manila Cut	1.25	@	1.50
Printed Manilas	.70	@	.60
Kraft	1.25	@	1.50
News and Scrap—			
Strictly Overissue	.80	@	—
Strictly Folded	.60	@	—
No. 1 Mixed Paper	.50	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06	@	.06¼
Fancy Shirt Cuttings	.02¼	@	.02½

THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

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Woolen manufacturers since 1856

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PILLOW BLOCKS

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"The Most Economical Bearings on the Market Today"

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For Pulp and Paper Mills

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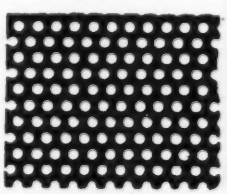

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The CLEARING HOUSE of THE PAPER TRADE

"SITUATIONS WANTED" ADVERTISEMENTS—4c a word, double rates for heavy face type. Minimum charge $1.00. If repeated ½ rate will be charged for each consecutive repetition.

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CLASSIFIED ADVERTISEMENTS—4c a word. Double rate for heavy face type. Minimum charge $1.00.

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SALARIED POSITIONS. $2,500 to $25,000. This thoroughly organized advertising service of 25 years' recognized standing and reputation carries on preliminary negotiations for positions of the calibre indicated, through a procedure individualized to each client's personal requirements. Several weeks are required to negotiate and each individual must finance the moderate cost of his own campaign. Retaining fee protected by a refund provision as stipulated in our agreement. Identity is covered and, if employed, present position protected. If you have actually earned over $2,500, send only name and address for details. R. W. Bixby, Inc., 117 Delward Bldg., Buffalo, N. Y.

WANTED—TOUR BOSS—2 machines all grades Boxboard. State age and experience and give references in first letter. Address Box 34-515, care Paper Trade Journal. N-15

TOILET PAPER SALESMAN, experienced, familiar with Metropolitan jobbing trade to represent manufacturer, drawing account against commission. Address Box 34-516, care Paper Trade Journal. N-15

SITUATIONS WANTED

SUPERINTENDENT wishes to make change. Energetic, capable and experienced in the manufacture of all grades of Combinations, Tags, Bottle Cap and Wallboards. Especial ability on repairs. Thorough knowledge of Power Plant and good color man. Can furnish best of references. Address Box 34-505, care Paper Trade Journal. N-29

WANTED—Position as plant, development and maintenance engineer with a paper mill or heavy chemical plant, by a middle aged technical graduate having a very broad combination of technical and mechanical experience. Can handle heat balances and design of special machines. Address Box 34-506, care Paper Trade Journal. N-22

WORKING MASTER MECHANIC or millwright machinist. 20 years' experience Pulp and Paper Mills. Cylinder Fourdrinier machines. Excellent references. Address Box 34-481, care Paper Trade Journal. N-15

COATING CHEMIST desires to make new connection with progressive company, preferably in East. Address Box 34-504, care Paper Trade Journal. N-15

WANTED

WANTED—One Guillotine Paper Cutter, modern make, 64" or wider. Send detailed description and price to Box 34-517, care Paper Trade Journal. N-15

READY to buy for cash obsolete stock and odd lots Waxed Papers, Tissue Paper; Card Board; Glassine and Parchment Paper; Paper Bags. Write particulars. Address Box 34-531, care Paper Trade Journal. N-15

WANTED—Two drum winder for 80" trim machine. Must be in first class condition. Give full information and price. Address Box 34-518, care Paper Trade Journal. N-15

WANTED—Cameron Winder capable of taking 72" roll. Must be in good condition. Address Box 34-519, care Paper Trade Journal. N-29

WANTED

WANTED—2—Finishing Room Cutters 48" or 54"; 2—Finishing Room Cutters 72" to 100" with or without layboys. Address Box 34-499, care Paper Trade Journal. N-22

WANTED—Several 12, 14 or 16 plate screens. Give report of age, condition, type plates, etc. Address Box 34-486, care Paper Trade Journal. N-15

WANTED—Three Roll Pasting Machines Wanted, about 52 inches wide, fully equipped with several drying drums, must be in perfect condition. Address Box 34-484, care Paper Trade Journal. N-15

WANTED—Used Paper Converting Machine Company Paper Napkin Quarterfolding Machine. Give full particulars. Address Box 34-510, care Paper Trade Journal. N-29

WANTED—Used paper napkin quarterfolding machine; one with embossing attachment preferred. Address Box 34-487, care Paper Trade Journal. N-15

WANTED—90" Super Calender; 100" Sheet Sheet Cutter; Seybold Cutter and Rewinder. Address Box 34-509, care Paper Trade Journal. N-22

MISCELLANEOUS

CLARK MANUFACTURING COMPANY, Holyoke, Mass. Telephone 2-4370. Builders of cylinder moulds, couch and felt rolls, dandy rolls. We cover dandies and cylinders tight for fast running machines. tf.

FOR SALE

FOR SALE—One 36" dia. x 84" face Wet Machine; one wooden felt washer; and one Lancaster 3 cylinder Pulp Washer, cylinders 36" dia. by 100" face. Good useable condition. Address Box 34-528, care Paper Trade Journal. N-15

FOR SALE—Several General Automatic Scale Co.'s Dormant floor scales, 3000 lb. capacity. Good condition. Address Box 34-529, care Paper Trade Journal. N-15

FOR SALE—Two Holyoke Platers taking sheets 36" x 30". Complete, good condition, reasonable price. Address Box 34-530, care Paper Trade Journal. N-15

FOR SALE—One Link Belt Electric Traveling Crane, 120' long, 23' span, 1½ ton capacity, and monorail. Address Box 34-527, care Paper Trade Journal. N-15

Address Replies

to advertisements appearing under Box Numbers in care of

PAPER TRADE JOURNAL

15 West 47th Street
New York, N. Y.

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PAPER COATING MACHINERY—Waxing, Oiling, Gumming, Gluing, Asphalt Duplexing Laboratory Coating and Treating machines. High speed. New improvement. MAYER COATING MACHINES COMPANY, INC., Rochester, N. Y. T.F.

FOR SALE—Seven nearly new cylinder moulds, Cheney Bigelow's recent construction. 30" diameter, 125" face. Journals finished for roller bearings. Cylinder moulds are covered with #14 backing wire and #60 facing wire. Moulds were used only a short time. Apply Riegel Paper Corp., Milford, N. J. N-22

FOR SALE—One carload Solid Wood Pulp Board in rolls 29⅜" wide, about 25" diameter, thickness .055. Board is first class, price $45.00 per ton, F.O.B. St. Louis. Will cut to sheets at $5.00 ton additional. Samples upon request. Orchard Paper Co., St. Louis, Mo. N-15

FOR SALE—74" Seybold "Holyoke" Paper Cutter Heavy Duty Machine. Condition guaranteed. Address Box 34-116, care Paper Trade Journal. N-15

FOR SALE—Following standard Moore & White single rotary sheet cutters with Moore & White Layboys. One 48" (also extra 48" Moore & White Layboy); one 62"; one 72"; one 91"; one 96". All above complete and in good operating condition. Reasonable prices, prompt delivery. Address Box 34-520, care Paper Trade Journal. N-15

FOR SALE—Four Jones Standard Imperial Jordan Engines. Two small Dillon Jordan Engines. Address Box 34-521, care Paper Trade Journal. N-15

FOR SALE—8—800 lb. and 11—1000 lb. E. D. Jones iron tub beaters. Good condition. Address Box 34-522, care Paper Trade Journal. N-15

FOR SALE—Two 36" seven roll Stacks of Holyoke Super Calenders. Rolls paper and steel perfect condition. Address Box 34-523, care Paper Trade Journal. N-15

FOR SALE—Savealls. One 44" x 48" Bird; and one 28" x 74" Improved Paper Machinery Co.'s. Address Box 34-524, care Paper Trade Journal. N-15

FOR SALE—Two 26" x 30" x 60" Hand Power Baling Presses. Heavy equipment, good condition. Address Box 34-525, care Paper Trade Journal. N-15

FOR SALE—Several one ton 42' span crane carriage equipments. Address Box 34-526, care Paper Trade Journal. N-15

FOR SALE

Fourdrinier Paper Machines with wires 107"—97"—90"—88". New Cylinder Paper Machines 90" wide. Hamblet & Moore & White Cutters 36" to 90" wide.

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175 Richdale Ave. Cambridge, Mass. TF

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DEPT. J
Green Bay . . . . . Wisconsin
MANUFACTURERS OF THE MOST MODERN AND COMPLETE LINE OF PAPER CONVERTING MACHINERY IN THE WORLD. YOUR INQUIRIES ARE RESPECTFULLY SOLICITED.

TENSILASTIC
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Laboratory Controlled At Every Stage of Processing
AMERICAN WRINGER CO., INC., Woonsocket, R. I.

Appleton Wires
are good wires
APPLETON WIRE WORKS INC. APPLETON WIS.

PULP MILL MACH'Y FINISHING ROOM MACH'Y
— FRICTION CLUTCHES —
The MOORE & WHITE Co.
PHILADELPHIA, PA.
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The Waterbury Felt Co.
SKANEATELES FALLS, N. Y.

"YOUR PAPER IS MADE IN YOUR BEATERS"
Dilts
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Steam Turbines—Catalog D . . Centrifugal Pumps—Catalog B
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MADE SPECIALLY FOR PAPER and PULP MILL USE
Copper, bronze, steel or other metals. Heat-treated.
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CINCINNATI, O.
We handle your rejections strictly according to the N. R. A. Code

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RAGS—BURLAP
BAGGING—ROPE
JUTE BUTTS, MAGAZINES, CATALOGS OLD PAPERS, THREAD WASTE AND ALL GRADES OF RAGS CUT QUICKLY AND EFFICIENTLY WITH THE
TAYLOR, STILES & COMPANY GIANT RIEGELSVILLE, N.J. U.S.A.

This is the GIANT 2A CUTTER WITH A CAPACITY OF 3000 lbs. PER HOUR
GIANT RAG CUTTERS HAVE CAPACITIES OF FROM 1 to 5 tons per hour.
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Paper Manufacturers Co., Inc.

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Potdevin Machine Co.
John Waldron Corp.

AGITATORS
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Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Hauser Stander Tank Co.
Moore & White Co.
Valley Iron Works Co.

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Ross Engrg. Corp., J. O.
Thwing Instrument Co.

AIR DRYING MACHINERY
Waldron, John, Corp.

AIR PREHEATING UNITS
Ross Engineering Corp., J. O.

ALLOYS
Chromium Corporation of America
Electro-Alloys Co., The
International Nickel Co.
Kropp Forge Co.
Pusey and Jones Corp.

ALUM
American Cyanamid & Chemical Corp.
Paper Makers Chemical Corp.
Pennsylvania Salt Mfg. Co.

AMMONIA
American Cyanamid & Chem. Corp.
Mathieson Alkali Works, Inc.
Pennsylvania Salt Co.

ARCHITECTS AND ENGINEERS
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Hardy, George F.

ARMORING FLOOR
Hendrick Mfg. Co.

ASBESTINE PULP
International Pulp Co.

AUTOMATIC WATER FEEDER
Merritt Engineering & Sales Corp., The

BACKING WIRES
Appleton Wire Works
International Wire Works

BAG MACHINES
Potdevin Machine Co.
Smith & Winchester Mfg Co.

BALERS
Ohio Cultivator Co.

BARKERS
Carthage Machine Co.
Valley Iron Work Co.

BARS (Beater)
International Nickel Co.

BEARINGS
Chain Belt Co.
Link-Belt Co.
Montague Machine Works
S. K. F. Industries
The Manhattan Rubber Mfg. Co.
Timken Roller Bearing Co.

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The Appleton Machine Co.
Dilts Machine Works, Inc.
Jones & Sons Co., E. D.
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BEATER ATTACHMENTS
Bird Machine Company

BEATER BED PLATES
Dayton Globe Iron Works
Dilts Machine Works, Inc.
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Taylor, Stiles & Co.
Valley Iron Works Co.

BEATER CONTROLS
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BEATER ENGINE BARS
Dayton Globe Iron Works
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.
Taylor Stiles & Co.
Valley Iron Works Co.

BEATER HOODS
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.

BEATER ROLLS
Dayton Globe Iron Works
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.

BEATER STOCK RECORDER
Bristol Co., The
Merritt Engineering & Sales Corp., The

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Goodyear Tire & Rubber Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
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Flexible Steel Lacing Co.

BLEACH EJECTORS
Perkins & Sons, Inc., B. F.

BLEACHING APPARATUS
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Moore & White Co.

BLEACHING POWDER
Mathieson Alkali Works, Inc.
Pennsylvania Salt Co.

BLEACHING PROCESS
Electro Bleaching Gas Co.
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BLOW PIPING
Moore & White Co.

BLOW PITS
Hauser Stander Tank Co.
Kalamazoo Tank & Silo Co.

BLOWERS (CENTRIFUGAL)
De Laval Steam Turbine Co.
Ross Engineering Corp., J. O.
Sturtevant Co., B. F.

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Magnus Chemical Co.

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Harrington & King Perforating Co.
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Moore & White Co., The

BREAKER BEATER WATER FEEDER
Merritt Engineering & Sales Corp., The

BUCKETS (elevating)
Chain Belt Co.
Hendrick Mfg. Co.
Link-Belt Co.

BULKERS (Pressure)
B. F. Perkins & Son, Inc.

BUNDLING PRESSES
Paper Converting Machine Co., Inc.
Potdevin Machine Co.

BURSTING TESTERS
E. J. Cady & Co.
B. F. Perkins & Son Co.
Testing Machines, Inc.

CALCIUM HYPOCHLORITE
Mathieson Alkali Works, Inc.
Pennsylvania Salt Mfg. Co.

CALENDERS
Beloit Iron Works
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Moore & White Co.
Norwood Engrg. Co.
Perkins & Son, Inc., B. F.
Smith & Winchester Mfg. Co.
Textile Finishing Mchy. Co.

CALENDER DOCTORS
Ticonderoga Machine Works

CALENDER ROLL GRINDERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Smith & Winchester Mfg. Co.
Ticonderoga Machine Works

CALENDER ROLLS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Perkins & Son, Inc., B. F.
Smith & Winchester Mfg. Co.
Textile Finishing Mchy. Co.
Waldron, Corp., John

CALIPERS (Micrometer Roll)
Cady & Co., E. J.
Farrell-Birmingham Co.
Lobdell Car Wheel Co.

CAMERAS (Photomicrographic)
Bausch & Lamb Optical Co.

CARBON BISULPHIDE
Pennsylvania Salt Co.

CASEIN
American Cyanamid & Chemical Corp.
The Casein Manufacturing Co. of America
Paper Makers Chemical Corp.

CASTINGS
Carthage Machine Co.
Chain Belt Co.
International Nickel Co.
Farrel-Birmingham Co.
Frederick Iron and Steel Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Pusey and Jones Corp.

CASTINGS (Brass, Bronze, Iron)
Smith & Winchester Mfg. Co.

CASTING (Chrome Nickel Alloy)
Lobdell Car Wheel Co.

CASTINGS (Iron)
Chain Belt Co.
Hamblet Machine Co.
Link-Belt Co.

CAUSTIC SODA
American Cyanamid & Chemical Corp.
Mathieson Alkali Works, Inc.
Paper Makers Chemical Corp.
Pennsylvania Salt Mfg. Co.

CELLULOSE BAG MACHINERY
Potdevin Machine Co

CENTRIFINERS
Bird Machine Company

CENTRIFUGALS
Bird Machine Company

CENTRIFUGAL MACHINERY (Special)
De Laval Steam Turbine Co.

CHAIN DRIVES
Chain Belt Co.
Link-Belt Co.

CHEMICALS
American Cyanamid & Chemical Corp.
Campbell & Co., John
E. I. DuPont de Nemours & Co., Inc.
Electro Bleaching Gas Co.
General Chemical Co.
General Dyestuff Corp
Geigy Co., Inc.
New York Color & Chemical Co., Inc.
Paper Makers Chemical Corp.
Williams & Co., C. K.

CHIPPERS
Carthage Machine Co.
Valley Iron Works Co.

CHLORINE
Electro Bleaching Gas Co.
Mathieson Alkali Works, Inc.
Pennsylvania Salt Co.

CHROME PLATE
Chromium Corporation of America

CHUCKS
John Waldron Corp.

CLAY
American Cyanamid & Chemical Corp.
Ashcraft Wilkinson Co.
English China Clays Sales Corporation
Paper Makers Importing Co.
Vanderbilt Co., R. T.

CLEANERS (Wire)
Bird Machine Company

CLEANING MATERIALS
Magnus Chemical Co.

CLUTCHES
Chain Belt Co.
Link-Belt Co.
Moore & White Co.
Pusey and Jones Corp.

CLUTCH PULLEYS
Moore & White Co.

COATING MACHINERY
Moore & White Co.
Potdevin Machine Co.
Waldron Corporation, John

COATING MATERIALS
National Oil Products Co.
Paper Makers Chemical Corp.

COCKS, Lubricated
Crane Company

COGS
Bowsher, N. P., The
Dayton Globe Iron Works

COLLAPSIBLE WINDER SHAFTS
Moore & White Co.

COLORIMETERS
Bausch & Lomb Optical Co.

COLOR ANALYZERS
Thwing Instrument Co.

COLOR MIXING EQUIPMENT
Waldron, John, Corp.

COMBINING MACHINES
Waldron Corp., John

COMPRESSORS (Air)
Allis-Chalmers Mfg. Co.

COMPRESSORS (Centrifugal)
De Laval Steam Turbine Co.

CONDITIONERS (Felt)
Bird Machine Company

CONSISTENCY REGULATOR
Merritt Engineering & Sales Corp., The
Trimbey Machine Works

CONTINUOUS BEATER ATTACHMENTS
E. D. Jones & Sons Co.

CONTINUOUS BEATERS
E. D. Jones & Sons Co.
Valley Iron Works Co.

CONTINUOUS BEATER WATER FEEDER
Merritt Engineering & Sales Corp., The
Trimbey Machine Works

CONTROLLING INSTRUMENTS
Bristol Co., The
Merritt Engineering & Sales Corp., The
Testing Machines, Inc.
Thwing Instrument Co.

CONTROLS (Electric)
Thwing Instrument Co.

CONVEYOR CHAINS
Chain Belt Co.
Link-Belt Co.

CONVEYORS (Trim)
Link-Belt Co.
Ross Engineering Corp., J. O

COOKING & RECOVERY PROCESS
Chemipulp Process, Inc.
Ross Engineering Corp., J. O

CORES (Paper)
Climax Tube Co.
Elixman Paper Co.

CORES (Steel)
Smith & Winchester Mfg. Co.

COTTON CALENDER ROLLER
Perkins & Son, Inc., B. F.
Textile Finishing Mchy. Co.

COUCH ROLLS
American Wringer Co.
Beloit Iron Works
Goodrich Rubber Co., B. F.
Montague Machine Co.
Moore & White Co., The
The Manhattan Rubber Mfg Division of Raybestos-Manhattan, Inc.
Pusey and Jones Corp.

COUPLINGS
Chain Belt Co.
De Laval Steam Turbine Co.
Frederick Iron and Steel Co.
Waldron Corp., John
Walworth Co.
Westinghouse Electric & Mfg. Co.

CREPING MACHINES
Beloit Iron Works
Paper Converting Machine Co., Inc.
John Waldron Corp.

CYLINDER RAILROAD AND DEVIL DUSTER
Moore & White Co.

CYLINDER DRIVES
Moore & White Co., The

CYLINDER MOULDS
Beloit Iron Works
Carthage Machine Co.

CYLINDER WIRES
Appleton Wire Works
International Wire Works

WHERE TO BUY

DAMPENERS
Perkins & Son, Inc., B. F.
DECKERS
Carthage Machine Co.
Montague Machine Co.
Oliver United Filters Inc.
Valley Iron Works
DEFOAMERS
Campbell & Co., John
National Oil Products Co.
DENSITY REGULATOR
Merritt Engineering & Sales Corp., The
DENSOMETERS
W. & L. E. Gurley
DIE CUTTERS
Appleton Machine Co., The
DIGESTERS
Pusey & Jones Corp.
DOCTORS
Bird Machine Company
DOCTOR BLADES
Goodrich Rubber Co., B. F.
International Nickel Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc
DRIVES
Bird Machine Company
DRIVE STANDS
Beloit Iron Works
Moore & White Co.
Pusey and Jones Corp.
DRIVES (Paper Machinery)
Beloit Iron Works
Chain Belt Co.
Farrel-Birmingham Co.
General Electric Co.
Link-Belt Co.
Pusey & Jones Corp.
DRYING SYSTEMS
Ross Engineering Corp., J. O.
Waldron Corporation, The
DUSTING MACHINERY
Carthage Machine Co.
Jones & Sons Co., E. D.
Moore & White Co.
DYESTUFFS & COLORS
Campbell & Co., John
E. I. DuPont de Nemours & Co.
General Dyestuff Corp.
Heller & Merz
Geigy Co., The
National Aniline & Chemical Co.
New York Color & Chemical Co., Inc.
United Color & Pigment Co.
C. K. Williams & Co.
ELECTRIC EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Electric & Mfg. Co.
ELEVATORS
Chain Belt Co.
EMBOSSING CALENDERS
Perkins & Sons, Inc., B. F.
Textile Finishing Machinery
EMBOSSING MACHINES
Hudson Sharp Machine Co.
Paper Converting Machine Co.
John Waldron Corp.
EMBOSSING ROLLS
The Appleton Machine Co.
Hudson Sharp Machine Co.
B. F. Perkins & Son, Inc.
Textile Finishing Mchy. Co.
Waldron Corporation, John
EXHAUST FANS
Propellair, Inc.
EXTRACTORS
Downingtown Manufacturing Co.
Valley Iron Works Co.
EXTRACTORS (Beater)
Bird Machine Company
FANS
E. D. Jones & Sons Co.
B. F. Perkins & Son, Inc.
Propellair, Inc.
Ross Engineering Co., J. O.
Sturtevant Co., B. F.
FAN PUMPS
Beloit Iron Works
Carthage Machine Co.
Moore & White Co.
Pusey and Jones Corp.
Valley Iron Works Co.
Smith & Winchester Mfg. Co.
FELT CARRIER ROLLS
American Wringer Co.
Beloit Iron Works
Goodrich Rubber Co., B. F.
Pusey and Jones Corp.
FELT CLEANERS
Magnus Chemical Co.
FELTS AND JACKETS
Appleton Woolen Mills
Bulkley, Dunton & Co.
Draper Bros. Co.
Huyck & Son, E. C.
Knox Woolen Co.
Lockport Felt Co.
Orr Felt & Blanket Co.
Philadelphia Felt Co.
Shuler & Benninghofen
Turner, Halsey Co.
Waterbury Felt Co.

FELT GUIDES
Moore & White Co.

FELT SOAPS
Magnus Chemical Co.

FELT TIGHTENER (Automatic)
Pusey and Jones Corp.
John Waldron Corp.

FILLINGS (Jordan)
International Nickel Co.

FILTERS
Moore & White Co.
Norwood Engrg. Co.
Oliver United Filters Inc.
J. O. Ross Engrg. Corp.

FILTER CLEANERS
Magnus Chemical Co.

FILTER WIRES
Appleton Wire Works

FITTINGS (Pipe)
Crane Company

FLANGES
Crane Company
Walworth Co.

FLAT SCREENS
The Appleton Machine Co.
Beloit Iron Works
Downingtown Mfg. Co.

FLEXIBLE COUPLINGS
Chain Belt Co.
De Laval Steam Turbine Co.
Frederick Iron & Steel Co.
Link-Belt Co.
John Waldron Corp.

FLEXIBLE SLICE
E. D. Jones & Sons Co.

FLEXIBLE STEEL LACING
Flexible Steel Lacing Co.

FLOOR TILE (Non-Slip)
Carborundum Co.
Norton Co.

FLY BARS
Dilts Machine Works, Inc.
Jones & Sons Co., E. D.

FOLDING ENDURANCE TESTERS
Testing Machines, Inc.

FOLDING MACHINES
Hamblet Machine Co.
Hudson Sharp Machine Co.
Paper Converting Machine Co., Inc.
Waldron, John, Corp.

FORGINGS (Drop & Hammer)
Kropp Forge Company

FOURDRINIER WIRES
Appleton Wire Works
International Wire Works

FREENESS RECORDERS
Trimbey Machine Works

FREENESS TESTERS
Testing Machines, Inc.

FRICTION CALENDERS
Perkins & Son, Inc., B. F.
Textile Finishing Mchy. Co.

FRICTION CLUTCHES
Beloit Iron Works
Link-Belt Co.
Moore & White Co
Pusey and Jones Corp.

GATES
Dayton Globe Iron Works

GEARS
Chain Belt Co.
Farrel-Birmingham Co.
Dayton Globe Iron Works
De Laval Steam Turbine Co.
E. D. Jones & Sons Co.
Link-Belt Co.
Moore & White Co.
Sturtevant Co., B. F.
Pusey and Jones Corp.
John Waldron Corp.

GENERATORS
De Laval Steam Turbine Co.
General Electric Co.

GRANITE ROLLS
Beloit Iron Works
Perkins & Sons, Inc., B. F.
Pusey and Jones Corp.

GRATING (Sidewalk)
Hendrick Mfg. Co.

GRINDERS
Carthage Machine Co.
Montague Machine Co.

GRINDING WHEELS
E. C. Atkins & Co.
Carborundum Co.
Norton Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.

GUIDES (Automatic Web)
John Waldron Corp.

GUIDES (FELT)
Moore & White Co.

GUMMING AND GLUING MACHINERY
Potdevin Machine Co.
Waldron Corporation, John

GUMMED SEALING TAPE
Paper Manufacturers Co.

GUMMED TAPE TESTERS
Thwing Instrument Co.

HAND CLEANER
Magnus Chemical Co.

HAND CLEANER DISPENSERS
Magnus Chemical Co.

HEATERS (Unit)
J. O. Ross Engrg. Corp.

HEATING AND VENTILATING SYSTEMS
Ross Engineering Corp., J. O.

HIGH DENSITY THICKENERS
Moore & White Co.

HOISTS (ELECTRIC)
General Electric Co.

HYDRAULIC MACHINERY
Farrel-Birmingham Co.

INDICATORS
The Bristol Co.
Testing Machines, Inc.

INTERFOLDING MACHINES
Hudson Sharp Machine Co.
Paper Converting Machine Co., Inc.
John Waldron Corp.

INSTRUMENTS
The Bristol Co.
W. & L. E. Gurley
Testing Machines, Inc.
Thwing Instrument Co.

JORDANS
The Appleton Machine Co.
Jones & Sons Co., E. D.
Smith & Winchester Mfg. Co.
Valley Iron Works

JORDAN FILLINGS
Bahr Bros. Mfg. Co., The
Jones & Sons Co., E. D.
Smith & Winchester Mfg. Co.
Valley Iron Works

KNIVES, ETC.
E. C. Atkins & Co.
Carthage Machine Co.
Dilts Machine Works, Inc.
Hamblet Machine Co.
Taylor, Stiles & Co.

LABELLING MACHINES
Potdevin Machine Co.

LABORATORY EQUIPMENT
E. D. Jones & Sons Co.
Pusey and Jones Corp.
Testing Machines, Inc.
Thwing Instrument Co.
Valley Iron Works.

LATEX
Heveatex Corporation

LATHES
Montague Machine Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.

LITHOPONE
United Color & Pigment Co.

LOFT DRYERS
Ross Engineering Corp., J. O.
John Waldron Corp.

LUBRICANTS
Gulf Refining Co.
Port Huron Xylite Co.
Socony-Vacuum Corporation

MACHINE PARTS (Forged)
Kropp Forge Co.

MAGNIFIERS (Pocket)
Bausch & Lomb Optical Co.

METERING & PROPORTIONING SYSTEMS
Trimbey Machine Works

MICRO-PROJECTORS
Bausch & Lomb Optical Co.

MICROSCOPES
Bausch & Lomb Optical Co.
Testing Machines, Inc.

MOTORS
Allis-Chalmers Mfg. Co.
General Electric Co.

MOULDS
Carthage Machine Co.
International Nickel Co.
Montague Machine Co.

NAPKIN FOLDING MACHINES
Hudson Sharp Machine Co.
Paper Converting Machine Co., Inc.
Waldron, John, Corp.

OPACIFYING PIGMENT
New Jersey Zinc Co.
Titanium Pigment Co.
United Color & Pigment Co.
R. T. Vanderbilt Co.

PACKING (Rubber)
B. F. Goodrich Rubber Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
U. S. Rubber Co.

PAPER BAG MACHINERY
Potdevin Machine Co.
Smith & Winchester Mfg. Co.

PAPER BREAK RECORDERS
Thwing Instrument Co.
Westinghouse Electric & Mfg Co.

PAPER CUTTERS
E. C. Atkins & Co.
Hamlet Machine Company
Moore & White Co.
Seybold Machine Co.
Smith & Winchester Mfg. Co.

PAPER MACHINE APRONS
Goodrich Rubber Co., B. F.

PAPER MANUFACTURERS
Hammermill Paper Co.
West Virginia Pulp & Paper Co.

PAPER MACHINE HOODS
Ross Engineering Corp., J. O.

PAPER MACHINE SLICES
Montague Machine Co.

PAPER AND BOARD CUTTERS
Beloit Iron Works

PAPER AND PULP MACHINERY
Beloit Iron Works
Downingtown Manufacturing Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
Pusey & Jones Corp.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

PAPER ROLLS
B. F. Perkins & Son, Inc.
Textile Finishing Mchy Co.
Waldron Corp., John

PAPER SCALES
Testing Machines, Inc.
Thwing Instrument Co.

PAPER STOCK WASHERS
Jones & Sons Co., E. D.

PAPER TESTERS
Perkins & Son, Inc., B. F.
Testing Machines, Inc.
Thwing Instrument Co.
Valley Iron Works Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Langston Co., Samuel M.

PAPER WAXING MACHINERY
Waldron Corp., John

WHERE TO BUY

PASTING MACHINES
Potdevin Machine Co.
John Waldron Corp.

PENESCOPE PENETRATION TESTER
Thwing Instrument Co.

PERFORATING MACHINES
Dietz Machine Works
Waldron, John, Corp.

PERFORATED METAL
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE (Stainless)
International Nickel Co.
Mundt & Sons, Charles

PIPING
Crane Company

PLATING, CHROMIUM
Chromium Corp. of America

PLATERS
Perkins & Son, Inc., B. F.

PLAYING CARD MACHINERY
Waldron, John, Corp.

POWER TRANSMISSION EQUIPMENT
Chain Belt Co.
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
Link-Belt Co.

PRECISION INSTRUMENTS
The Bristol Co.
Taylor Instrument Co.
Testing Machines, Inc.
Thwing Instrument Co.

PRESSES (Napkin)
Paper Converting Machine Co.
Waldron Corp., John

PRESS ROLLS
American Wringer Co., Inc.
Beloit Iron Works
Downingtown Manufacturing Co.
Goodrich Rubber Co.
Montague Machine Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Pusey & Jones Corp.
Valley Iron Works Co.

PRESS ROLLS (Granite)
Beloit Iron Works
Perkins & Sons, Inc., B. F.
Pusey and Jones Corp.

PRESSURE BULKER
B. F. Perkins & Son, Inc.

PRINTING MACHINES
Potdevin Machine Co.
Waldron, John, Corp.

PRINTING PRESSES
Hudson Sharp Machine Co.
Potdevin Machine Co.
Paper C onverting Machine Co., Inc.
John Waldron Corp.

PULLEYS
Chain Belt Co.
Link-Belt Co.
Montague Machine Co.

PULMAX DRIVES
Bird Machine Company

PULPERS
E. D. Jones & Sons Co.

PULP MILL EQUIPMENT (Chemical)
Carthage Machine Co.
Chemipulp Process, Inc.

PULPSTONES
Carborundum Co.
Norton Co.

PULP PRESSES
Farrel-Birmingham Co.

PULP SCREENS
E. D. Jones & Sons Co.
Trimbey Machine Works

PULPS (SULPHITE)
Andersen Co., J.
Lagerloef Trading Co.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PULP THICKENERS
Moore & White Co.

PUMP PRIMERS (Steam and Water Jet)
Valley Iron Works Co.

PULP WOOD MACHINERY
Montague Machine Co.

PUMPS (Acid)
Carthage Machine Co.
De Laval Steam Turbine Co.
Frederick Iron and Steel Co.
Moore & White Co.
Morris Machine Works
Oliver United Filters Inc.
Pusey and Jones Corp.
Valley Iron Works

PUMPS (Centrifugal)
Allis-Chalmers Co.
Pusey and Jones Corp.

PUMPS (Reciprocating)
Morris Machine Works

PUMPS (Rotary Cycloidal)
Morris Machine Works

PUMPS (Stuff)
Allis-Chalmers Co.
Beloit Iron Works
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Frederick Iron and Steel Co.
International Nickel Co.
Moore & White Co.
Morris Machine Works
Oliver United Filters Inc.
Pusey and Jones Corp.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

PUMPS (Suction)
Moore & White Co.
Morris Machine Works

PUMPS (Vacuum)
Morris Machine Works

PYROMETERS (Roll)
The Bristol Co.
Thwing Instrument Co.

RAG CUTTERS
Perkins & Son, Inc., B. F.
Taylor Stiles & Co.

REAM COUNTERS
Hamblet Machine Co.

RECORDING INSTRUMENTS
The Bristol Co.
Taylor Instrument Co.
Testing Machines, Inc.
Thwing Instrument Co.

RECORDING TACHOMETERS
The Bristol Co.
General Electric Co.
Pusey & Jones Corp.

RECOVERY SYSTEMS (Soda & Sulphite)
Ross Engineering Corp., J. O.

RECOVERY SYSTEMS (Waste Heat)
Ross Engrg. Corp., J. O.

REELS, (Upright & Revolving)
Beloit Iron Works
De Laval Steam Turbine Co.
Moore & White Co.
Pusey & Jones Corp.

REFINERS (Centrifugal)
Bahr Bros.

REFINING ENGINES
Jones & Son Co., E. D.

REFRACTORIES
Carborundum Co.
Norton Co.

REGULATORS
The Bristol Co.
Merritt Engrg. & Sales Co., Inc.
Trimbey Machine Works

REPAIRS
Dayton Globe Iron Works

REWINDERS
Beloit Iron Works
Cameron Machine Co.
Deitz Machine Works
Hamblet Machine Co.
Langston Co., Samuel M.
Moore & White Co.
Smith & Winchester Mfg. Co.
John Waldron Corp.

ROD MILL
Allis-Chalmers Co.
Mine & Smelter Supply Co.

ROLLS
American Wringer Co.
Goodrich Rubber Co.
Montague Machine Co.
Textile Finishing Machy. Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
John Waldron Corp.

ROLLS (Chilled Iron & Gray Iron)
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

ROLLS (Forged)
Kropp Forge Co.

ROLLS (Rubber or Rubber Covered)
American Wringer Co.
B. F. Goodrich Rubber Co.
Montague Machine Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

ROLL GRINDERS
Farrel-Birmingham Co.
Lobdell Car Wheel Co.

ROLL SLITTING MACHINES
Cameron Machine Co.
Langston Co., Samuel M.

ROLL STANDS
Cameron Machine Co.
Moore & White Co.

ROLL WINDING MACHINES
Cameron Machine Co.

ROOF PLANKS (Awico-ized)
Processed Lumber Co.

ROSIN SIZE
American Cyanamid & Chemical Corp.
Bennett, Inc.
Paper Makers Chemical Co.

ROTARY SCREENS
E. D. Jones & Sons Co.
Moore & White Co.
Valley Iron Works

RUBBER GOODS
American Wringer Co.
Goodyear Tire & Rubber Co.
B. F. Goodrich Rubber Co.
The Manhattan Rubber Mfg. Co.
United States Rubber Co.

RUBBER HOSE
B. F. Goodrich Rubber Co.
Goodyear Tire & Rubber Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

SALT
Pennsylvania Salt Co.

SAND & POLISHING MACHINES
Carborundum Co.
Waldron, John, Corp.

SATURATING MACHINES
Moore & White Co.
Potdevin Machine Co.
Waldron, John, Corp.

SAVEALLS
Bird Machine Company
Carthage Machine Co.
De Laval Steam Turbine Co.
Moore & White Co.
Oliver United Filters Inc.

SAWS
E. C. Atkins & Co.

SCALES
Cady & Co., E. J.

SCORE TESTERS
Thwing Instrument Co.

SCREEN DIAPHRAGMS
Goodrich Rubber Co., B. F.

SCREENS
Appleton Wire Works
Beloit Iron Works
Bird Machine Company
Carthage Machine Co.
Chain Belt Co.
International Wire Works
E. D. Jones & Sons Co.
Link-Belt Co.
Montague Machine Co.
Moore & White Co.
Valley Iron Works

SCREENS (Perforated Metal)
Harrington & King Perforating Co.
Charles Mundt & Sons

SCREEN PLATE
Hendrick Mfg. Co.
Union Screen Plate Co.

SEALING TAPE (Gummed)

SEPARATORS (Centrifugal)
Bird Machine Company
Paper Manufacturers, Inc.

SHAFTS (Forged)
Kropp Forge Co.

SHEAVES
Montague Machine Co.

SHOWER PIPES
Bird Machine Company
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
Smith & Winchester Mfg. Co.

SHREDDERS (Pulp and Paper)
Carthage Machine Co.
E. D. Jones & Sons Co.
Taylor Stiles & Co.

SILICATE OF SODA
American Cyanamid & Chemical Corp.

SIZING
National Oil Products

SIZING PROCESS
Bennett, Inc.
National Oil Products Co.
Ross Engrg. Corp., J. O.

SLIME REMOVER
Magnus Chemical Co.

SLITTERS AND REWINDERS
Beloit Iron Works
Cameron Machine Co.
Dietz Machine Works
Hamblet Machine CO .
Langston Co., Samuel M.
Moore & White Co.
Pusey & Jones Corp.
Smith & Winchester Mfg. Co.
Waldron Corporation, John.

SODA ASH
American Cyanamid & Chemical Corp.
Diamond Alkali Company
Mathieson Alkali Works, Inc.
Paper Makers Chemical Corp.
Pennsylvania Salt Mfg. Co.
Solvay Sales Corp.

SOAP POWDER
Magnus Chemical Co.
Paper Makers Chemical Corp.

SOLVENT SIZING
Beloit Iron Works

SORTING TABLES
Moore & White Co.

SPECIAL MACHINERY
Carthage Machine Co.
Farrel-Birmingham Co.
Hamblet Machine Co.
Hudson Sharp Machine Co.
Montague Machine Co.
Paper Converting Machine Co., Inc.
John Waldron Corp.

SPEED CHANGES (Variable)
Moore & White Co.

SPEED REDUCERS
Beloit Iron Works
De Laval Steam Turbine Co.
Farrel-Birmingham Co.
Link-Belt Co.
Pusey and Jones Corp.

SPIRAL BEVEL GEARS DRIVE STANDS
Beloit Iron Works
Moore & White Co.
Pusey and Jones Corp.

SPROCKETS
Chain Belt Co.

STAIR and FLOOR TILES—(Non-Slip)
Carborundum Co.
Norton Company

STAIR TREADS
Carborundum Co.
Norton Company

STARCH
American Cyanamid & Chemical Corp.
Clinton Co.
Corn Products Refining Co.

STEAM SPECIALTIES
Crane Company

STEEL BELT LACING
Flexible Steel Lacing Co.

STOCK CUTTERS
Perkins & Sons, Inc., B. F.

STEEL (Electric Furnace)
Timken Roller Bearing Co.

STEEL (Open Hearth)
Timken Roller Bearing Co.

STEEL (Stainless)
Jones & Sons Co., E. D.

STEEL PLATE CONSTRUCTION
Hendrick Mfg. Co.
Link Belt Co.
Ross Engrg. Corp., J. O.

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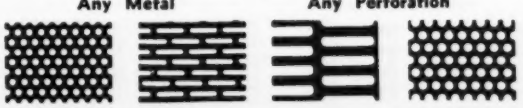

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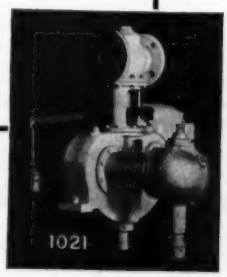

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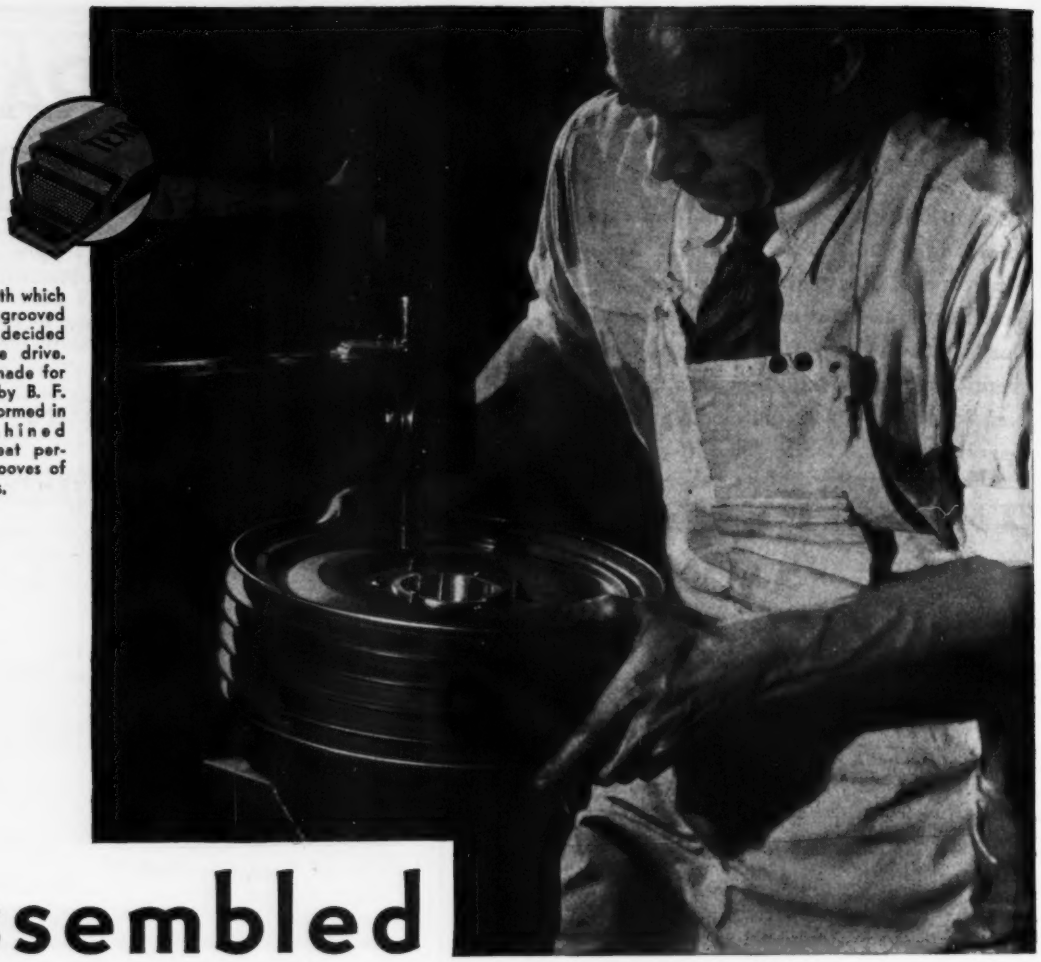

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